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Innovation and Upheaval: Early Growth in the Greek Capital Market

Listings and IPOs from 1880 to World War II in the Athens Stock Exchange

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ABSTRACT

The establishment and growth of the Greek stock market were coincident with development episodes, financial upheavals and geographic expansions of the country's economy over the period 1880-1940. We explore the growth of the Athens Stock Exchange (ASE) through new listings and Initial Public Offerings (IPOs) in the late 19th and early 20th centuries. We examine changes in exchange governance and listing requirements. On a theme not addressed before**,** we find that simple listings were far more numerous than actual IPOs. IPOs in Greece remained unregulated throughout the period. Their under-pricing became pronounced in the later parts of the period, especially the 1920s. The study presents data on 'quasi-IPOs' (i.e. capital increases shortly after listing) and shows that they offer a more accurate assessment of the demand for the financing of listing firms in an emerging market. Robust evidence is presented that as the Exchange developed it also underwent a change in character, becoming more oriented to the domestic market and catering to smaller firms in domestic manufacturing in the post-World War I era that marked the end of early globalization.

JEL classification: N23, N43, G18.

Keywords: Listings, Initial public offerings; financial history; financial innovation; Athens Stock Exchange

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I. Introduction

The object of this paper is the study of listings and public offerings of securities in the Athens Stock Exchange (ASE) from its inception in 1880 to the entry of Greece into the second war in 1940. No previous comparable research exists for the growth of the Greek Stock Exchange. This is a first study of capital raising in an emerging European Exchange to be juxtaposed to several such studies of developed exchanges in the late 19th and early 20th centuries [2].

Stock exchanges are trade venues but their longer-term significance lies in their role in the funding of public and private ventures and the growth of firms and sectors. The impetus for the development of exchanges in Europe since the 18th century has been furnished by the need to amass capital resources. Exchanges combine the collection of capital with the advantage of secondary trading. These two fundamental aspects of growth are not inseparable. Listing on an Exchange can occur with or without a concurrent public offering. Whereas a public offering is a direct capital-gathering exercise, listing can make an indirect contribution by increasing the visibility and the reputation of a potential issuer. In developed liquid markets, public offers are a very visible activity. In emerging less liquid markets however, simple listings may predominate in market development. The present study focuses on listings and public offerings as separable aspects of capital gathering. Our findings underpin this separation: public offerings in the ASE were relatively limited, even during periods when listings were in high demand. We offer analysis for this feature.

The creation of the ASE was the second major financial innovation in 19th century Greece, after the establishment of the National Bank in the 1840s. To acknowledge the international context, we note that the late 19th century was a period of 'emergence' of many peripheral stock markets in Europe and the rest of the world. These markets grew alongside well-established ones in the European centers[3]. Their 'emergence' was correlated with the rise of international capital flows to new sovereign states, especially in the form of government loans[4]. The ASE was no exception. Officially chartered over the period 1876-78, it started operations in 1880. In 1878 the Greek state had regained access to foreign finance after an embargo of 45 years. The ASE, in which both government bonds and private stocks would trade, was a necessary mechanism for capital gathering and transfer, and would prove to be one of the longest-lived institutions in modern Greece.

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[2] See studies for London, Berlin and New York by Derrien and Kesckes, 'The Initial Public Offerings of listed firms'; Chambers, 'Gentlemanly capitalism revisited: A case study of underpricing of initial public offerings on the London stock exchange, 1946–1986'; Lehman, 'Underwriter activity and performance of Initial Public Offerings in Imperial Germany between 1897-1914: The role of reputation' Chambers, 'Going public in interwar Britain'; Fohlin, 'Asymmetric information, market power, and the underpricing of new stock issues in Germany, 1882-1892'; Fohlin and Reinold 'Common stock returns in the pre-WWI Berlin stock exchange'; Chambers, 'Going public in interwar Britain'; Burhop; 'The underpricing of initial public offerings at the berlin stock exchange, 1870-96; Burhop et al., Regulating IPOs: Evidence from going public in London, 1900-1913'; Lehmann, 'Taking firms to the stock market: IPOs and the importance of large banks in imperial Germany, 1896-1913'.

[3] Batillosi and Morys, 'Emerging stock markets in historical perspective: A Research Agenda'.

[4] Bouvier, 'Iinitiation au vocabulaire et aux mécanismes économiques contemporains'; and O'Rourke and Williamson, 'Globalization and history, the evolution of nineteenth century atlantic economy', dicuss about the rise of international capital flows.

Greek political and economic history has been turbulent over the period 1880-1940. The country's area and population practically doubled. Changes were not gradual but abrupt, mostly outcomes of wars that were won and wars that were lost; and there was a succession of periods that ranged from sovereign bankruptcy in 1893 to impressive leaps in development in the early 1900s and the 1920s. Over the sixty years covered in this study, Greece was embroiled in six wars and two sovereign bankruptcies. The Exchange evolved along a path defined by economic conditions of each period[5]. Arguably, it provided a mechanism for mobilization of resources and modernization through the recapitalization of older firms and the emergence of new ventures and sectors.

Recent historical research on financial development has been influenced by prevalent institutional theories: one is the view of the positive impact of 'common law' systems[6]; the other is the view of the positive impact of 'openness' and capital flow liberalization which contain the power of domestic financial incumbents and liberate a financial dynamic[7]. The Greek legal system has been of the continental variety so that it cannot explain the variation between periods of market development and periods of stagnation. On the front of economic openness and the perspective argued by Rajan and Zingales, Greece followed the general path of many other European countries. It remained open to capital flows and participated in the rise of globalization up to the First World War. From that point on, Greece became a relatively closed economy but interestingly one with expanding frontiers. The actual occurrence and direction of capital flows varied throughout the period, especially as a result of sovereign bankruptcies, wars and the collapse of international monetary systems. In sum, we argue that the variation between stock market development and stagnation and the character of development cannot be prima facie attributed to large shifts in the legal system, but can be understood on the basis of economic 'openness' and economic size. In addition, and since historical detail matters, we focus on economic conjuncture and the factors affecting variation of the size and character of the domestic market that expanded significantly over the period of study. We provide a test of the relation of listing activity with economic growth, and find positive results.

Financial theories of capital gathering establish useful propositions that can inform historical study. It is generally acknowledged that markets for external finance can only function if there is an adequate level of trust between investors, issuers and sponsors. In a variety of financial models, a specific aspect of trust is represented as informational asymmetry. Prior argument and evidence indicate that such asymmetry can make the cost of external finance so high as to be prohibitive[8]. In a theoretical context more directly applicable to initial public offerings, it is

[5] Valaoritis, 'The history of the National Bank of Greece, 1842-1902'; Papagiannakis, 'The Greek rail-roads, (1882-1910)'; Kostis 'Les enfants gâtés de l'histoire: The formation of neo-hellenic state'; Psalidopoulos, 'The crises of 1929 and the Greek Economists'; Vaxevanoglou, 'The Greek Capitalists, 1900-1940'; Dertilis, 'History of the modern Greek state 1830-1920'; Kokinakis, 'Currency and politics in Greece 1830-1910'; Kremmidas, 'Introduction to Modern Greek Economic History' have discussed historic economic conditions in various periods.

[6] The legal rules covering protection of corporate shareholders and creditors in 49 countries have been examined by LaPorta, Lopez-Silanes, Shleifer and Vishny, '*Law and Finance'*, pp. 1113-1155.

[7] Rajan and Zingales, *'The great reversals: The politics of financial development in the twentieth century*', pp. 5-50 offer comparative aspects of stock market capitalization to GDP ratios and number of listed companies per million people.

[8] Myers and Majluf, 'Corporate financing and investment decisions when firms have information that investors do not have', show that firms may refuse to issue stock, and therefore may pass up valuable investment opportunities.

argued that asymmetric information among investors leads to underpricing of new issues, an effect likened to a 'winners curse'[9]. A considerable strand of subsequent literature has upheld the notion that institutional, regulatory and governance arrangements can mitigate asymmetries and improve trust[10]. Extensive empirical work in contemporary markets has verified however considerable underpricing of new equity issues, but with much variation across time and space[11].

Taking the cue from contemporary markets, historical researchers have focused on capital-gathering in the major European markets (where transactions and data are ample) and have examined the underpricing phenomenon in IPOs of the late 19th and early 20th centuries. Chambers and Dimson[12] examining the track record of the London Exchange[13], make a remarkable observation: a long-term rise in underpricing appears to have occurred over time, in spite of improvements in regulation, disclosure and the prestige of IPO underwriters.

Working on the Berlin Exchange, investors in new stock issues in Germany in the 1880s experienced, on the contrary, low spreads between the price they paid for stock and the price at which they could sell the stock in the market[14]. Evidence reveals that during the early 20th century IPOs were regulated more heavily in Germany than in Britain and as a result the failure rate of IPOs on the Berlin Stock Exchange was lower than it was in London.[15] Even though German IPO business was in the hands of an oligopoly, the terms of IPOs through tight regulation of underwriting, ensured the quality of firms on the German market[16]. We draw a lesson from regulatory experiences in early developed markets, as compared to a peripheral one with minimal regulation.

A peripheral emerging market, as the ASE in the 19th century, cannot be approached however on the same footing and with the same analytical agenda as developed central markets in Europe where frequent transactions and ample data are available. Its institutional reputation had to be established and its liquidity had to be secured in an environment where liquidity was generally scarce and monetary values exhibited great fluctuation. It follows that when we examine listing requirements and the growth of the Exchange in terms of listings and primary

[9] The 'winners curse' argument by Rock, *'Why new issues are underpriced*', pp. 187-212 depends upon the existence of a group of investors whose information is superior to that of all other investors.

[10] Beatty and Ritter *'Investment banking, reputation, and the underpricing of initial public offerings*', pp. 213-232, Loughran and Ritter, '*Why has IPO underpricing changed over time?'* pp. 5-37 and Ljunqgvist, 'IPO underpricing, in B. Eckbo', ed.: 'Handbook of corporate finance: Empirical corporate finance'.

[11] There are several studies of public offerings in the ASE but all focus on recent periods beginning with the 1980s[11] [e.g. Kazantzis and Levis, *'Price support and initial public offerings: Evidence from Athens Stock Exchange*', pp. 185-200; Thomadakis et al., '*Long term performance of Greek IPOs'*, pp. 117-141; Thomadakis et al, 'Collateral regulation and IPO specific liberalization: The case or price limits in the Athens Stock Exchange'. There are also few, mostly official, histories of the Exchange which do not illuminate sufficiently its fundamental function of capital gathering and company finance (see Platanopoulos, 'History of the Athens Stock Exchange', 1876-1976).

[12] Chambers and Dimson, *'IPO underpricing over the very long run'*, pp.1407-1443 present evidence covering British IPOs since World War I. During the period from 1917 to 1945, public offers were underpriced by an average of only 3.80%, as compared to 9.15% in the period from 1946 to 1986.

[13] In a modern study involving 786 IPOs in LSE, Derrien and Kesckes, 'The Initial Public Offerings of listed firms' present the case of a number of firms that list without issuing equity and then issuing equity shortly after, that this two-stage offering strategy is less costly than an initial public offering (IPO) because trading reduces the valuation uncertainty of these firms before they issue equity.

[14] Fohlin, *'Asymmetric information, market power and the underpricing of new stock issues in Germany*, 1882-1892', pp.630-56. Underwriters exploited their access to better information (agency problems) and had market power.

[15] IPOs listed on the London Stock Exchange performed as well as Berlin IPOs despite the Berlin market being more regulated, Burhop et al., 'Is regulation essential to stock market development? Going public in London and Berlin, 1900-1913'.

[16] Lehmann, 'Taking firms to the stock market: IPOs and the importance of large banks in imperial Germany, 1896-1913'.

offerings, we must be cognizant of a more general correlation of the path of the Exchange to economic and political conditions. Thus, we pay a lot of attention to historical circumstance in the Greek economy over the period.

Differing from studies focusing on developed markets, we have expanded the meaning of IPOs to capital increases occurring in the two years following listing. We have collected data on these capital increases and compare them to actual primary offerings. The view of listings as a first step towards the raising of external capital finds support from these comparisons. We also undertake limited analysis of IPO underpricing itself, within the confines of our small number of observations. The results are not surprising in the face of contemporary international evidence.

IPOs remained unregulated throughout the period and there is little evidence about the involvement of professional investment banking in primary security issues and their pricing. This is a major difference from developed markets of that period, where IPOs were regulated and investment banking was formalised. It does not appear that standardised arrangements of investment banking emerged in Greece, although some services of investment bankers were provided. Hence, disclosure quality remained uneven and low. The population of IPOs was also low. It is noteworthy nonetheless that even in this small population under-pricing made an appearance considerably after the end of the First World War. We present historical conjectures for the timid growth of IPOs and look at possible factors to explain IPO pricing in line with the empirical literature.

The early enlargement of the Greek stock market was clearly driven by demand for listings. This implies that, contrary to what we know of developed markets, the study of listings is a pillar for understanding the evolution of peripheral markets. In the Greek case, we document a decisive shift in the character, the size and sector of listings and IPOs between the first decades of ASE operation and the boom decade of the 1920s. This shift was related to a reorientation of economic activity, with emphasis on light domestic manufacturing. It also correlated to stock market entries by smaller firms, a phenomenon that may be described as a 'democratisation of market finance'. Interestingly, this democratization was evident in the population of listings but also implied visible changes in pricing of primary offerings.

The rest of the paper is organized as follows. Section II discusses the creation of the ASE, the evolution of its governance and listing requirements. Section III presents the periodization of our study, the historical features of each sub-period, and the related characteristics of our dataset. In Section IV we present the main statistical features of our dataset, including the discussion of quasi IPOs. We also present hypothesis about the macro-determinants of new listings. In Section V we undertake an analysis of IPO pricing and describe a model of underpricing. In Section VI we present empirical results of simple regression models. Section VII concludes the paper.

II. Exchange Foundation, Governance and Development

A. Unregulated Public Offers, the "Free Market" and the Genesis of an Organized Market

The birth of the ASE was doubtlessly conditioned by a dramatic precedent: a ferocious cycle of mania and panic that grew out of unregulated public offers of shares traded in an informal market in the early 1870s. The mania coincided with the first attempts at Greek industrialization[17], focused on mining and metalworking shares primarily, but encompassed banking shares as well. This was a time of speculative frenzy in other European exchanges. The link of the Athenian transactions with those of Europe was forged through the activities of Greek 'diaspora' financiers, who, during the 1870s, were increasingly active in Athens along with the Ottoman Empire and other European capitals[18].

Citizens of the independent Kingdom of Greece thus had their first serious brush with a speculative bubble in 1873. The public offer that sparked the mania was of shares in a company running the metal processing plant around the mine of Lavrion, a rich silver source in ancient times. Rumors and reckless political rhetoric about endless riches led to spectacular high prices, succeeded by rapid decline in early 1874[19]. The 'Lavreotika', as the events were called, would remain etched in collective memory. The inauguration of public offers of equity shares in Greece became an occasion of loss and social suspicion against financial tycoons. The social mistrust would influence both the decision to create an organized exchange and proceedings at that exchange for at least the early years of its operation.

The drama of boom and bust of 1873-74 played out in an informal market that was operating in and around a popular Athenian coffee house. Share sales were conducted literally 'over the counter' in coffee shops, grocery stores and merchant establishments. The organization of new issues, the pricing of the offers, and the details of distribution were managed primarily by the issuers and two newly founded merchant banks, the Credit Bank established in 1872 and the Industrial Credit Bank established in early 1873. The two banks had been launched by competing groups of recently arrived Greek 'diaspora' financiers and had also offered shares to the public. [20] Merchant banking was surely a significant innovation in the economy of Greece at the time. The prime mover of innovation was Andreas Syngros, a famous financier-tycoon who had made a fortune in the Ottoman Empire, trading commodities and Ottoman public bonds.

In the aftermath of the bust and the political outcry that ensued, the creation of an organized market was announced in 1876 with the publication of a royal decree that contained the first charter and a body of rudimentary rules of the Exchange. The rulebook would be revised in 1879 and actual operation would be inaugurated in 1880[21].

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[17] Agriantoni, 'The beginning of industrialization in 19th century Greece'.
[18] Syngros, 'The diaries'.
[19] The stock price of the Lavrion Metalworks went from 46 francs on April 17 1873 to 156 francs on May 1st, declining to 74 francs a few months later. See Dertilis 'The issue of banks', Appendix VII.
[20] Dertilis, *'History of the modern Greek state 1830-1920'*, pp. 411-412 and Platanopoulos, *'One Hundred Year of the Athens Stock Exchange'*, pp. 50-51.
[21] Athens Stock Exchange Organizational Charters 1876, 1879.

Operation has continued to this day, with several interruptions during wars and crises of course, making the ASE the second longest-lived financial institution in the country[22].

A landmark development that would change the course of the Greek market for capital had preceded the launch of the Exchange: the Greek State, embargoed for decades from international markets due to sovereign defaults in the 1830s, regained access to international borrowing[23]. This was a time in which the international markets for bonds were expanding, strong capital exports from the developed European economies were directed to the world periphery and the role of exchanges was prominent in the process. In that context, the prospect of capital inflows to Greece hastened the inauguration of the organized Exchange as an official trading venue for government paper, company equities or bonds[24].

A remarkable aspect of the Exchange as a public market for securities is that its charter included no regulation of public offers of shares, nor was a public offer required for listing. The absence of such provision appears all the more conspicuous considering the traumatic events of 1873-74, when the unregulated public offer of shares had been at the center of a big 'boom and bust' crisis. The continuation of the unregulated status of public offers testified to the power of issuers and financiers, especially at a time when Greece was reconnecting to the international financial market in which entrepreneurs belonging to the Greek Diaspora were already active.

In our view, a policy that could encourage IPO growth would have been quality regulation of IPOs and especially mandatory disclosure rules. Such regulation existed already in more developed markets. In Greece however it was not forthcoming. This is puzzling, considering that regulation of both listing requirements and transaction rules was undertaken during the period. The Exchange was not a government operation. It was a self-regulated entity governed by its members[25]. It had basic rules of transaction and settlement as well as minimum listing requirements. On its first bulletin issued on May 12, 1880[26], the 17 securities listed for trading included six government bonds, one corporate bond and ten company equities. As we document below, listings were far more numerous than initial public offerings. Most companies would acquire their first capital before listing by placement of shares among narrow groups or even a public offer. They would also engage in capital increases after listing. In following sections of the paper we will come back for a closer look at governance reforms and the analysis of listings and public offerings of private shares.

The inauguration of the Exchange did not subjugate legally (or in practice) the pre-existing 'free market' for shares, as the over-the-counter market was called in 19th century Athens. The two coexisted and operated in parallel. Shares listed on the Exchange would trade in both markets, but of course many non-listed shares were also traded over the counter. In fact, it appears that the 'free market' was a lively one. In the early years, trading on the

[22] The longest-lived financial institution is the National Bank of Greece which was founded in 1842.
[23] Dertilis, 'History of the modern Greek state 1830-1920'.
[24] Bouvier, '*Initiation au vocabulaire et aux mécanismes économiques contemporains'*, pp. 251-254.
[25] The Organizational Charter published in 1879 appointed a five-member committee as the governing board. All five members were licensed brokers. See Platanopoulos, *'History of the Athens Stock Exchange, 1876-1976'*, ibid, p. 37.
[26] Athens Stock Exchange, 'Review 1936' p.7 (1937).

Exchange would last for up to three quarters of an hour, but the 'free market' would continue. A contemporary newspaper reports that the more important transactions were conducted in the 'free market'[27]. In 1884 there was trading of 26 company shares (including a few foreign ones) in the 'free market', more than twice the number of shares listed on the Exchange. Some of the shares traded off-market would go on to become listed, having presumably proved their tradability[28]. It is notable that no foreign company issues were traded on the Exchange.

An early historian of the Athens exchange wrote: "this 'free market' operated in the streets around the Stock Exchange. It functioned from morning till night, often to midnight. It was not organized. Some dealers had offices others not. The trading customs followed those of the official exchange. Guarantees and sureties required were, as a rule, lower than the normal ones"[29]. The 'free market' was to be officially sidelined by the grant of monopoly status to the Exchange in 1918; however evidence of free market operations persists in press reports throughout the 1920s.

B. The Contours of Stock Exchange Development

In this section we present broad quantitative characteristics of the ASE, over the period examined, and its comparative appearance vis-à-vis other contemporary markets. Our evidence is limited, as we have no systematic data on trading volumes and transactions, until the very last part of the period. Nevertheless, we have hand calculated end-of-year estimates of capitalizations for selected years, which enable a comparative view. As mentioned in the previous section, during the first forty years of the period a 'free market' was functioning outside the official exchange, but so far we have discovered little reliable quantitative evidence of its activity. Thus, what we report here refers only to the official Exchange. We explain data sources and limitations in Appendix A.

The creation of stock exchanges in the 19th century was often motivated by trading needs for government debt. The Greek case was no exception, since its organization coincided with the re-entry of Greece into the international bond market. It is therefore important to gauge the relative weight of private stocks as compared to public and private debt securities. In Table 1 we present capitalizations for each category of security at the end of each decade from 1880 to 1930, all estimated in gold sovereigns.

Please Insert Table 1 about here

The relative weight of shares as compared to government bonds is not negligible, varying from a low of about 18 percent in 1900 to a high of 108 percent in 1920. It is important to note that large changes in the capitalization of public debt are observed in periods when public borrowing had intensified as was the case in the 1890s and the 1920s (We comment on financial events in these periods in section III below). Although we have no evidence on

[27] Newspaper 'Ermis' [Hermes] April 4, 1882.
[28] Newspaper 'Ermis' [Hermes] April 15, 1884.
[29] Keramidas, 'Stock Exchanges'.

trading volumes in the earlier periods, we can gain a glimpse of relative magnitudes in the period 1929-40, for which volume data is available, as shown in figure 1.

Please insert Figure 1 about here

The diagram shows clearly that trading volume for shares does surpass bond trading in some periods, notably in 1929, again as an indication that shares were by no means a negligible portion of Exchange activity. The fact that the Exchange became quickly a trading venue for private shares is significant as an indication that private sector activity was growing.

A second major question for which we gathered evidence is the comparative standing of the Athens Exchange relative to other contemporary exchanges. The starting point for a comparative view is to use widely accepted indices such as the ratio of capitalization to GDP and the number of listed firms per million of population. In order to obtain as broad a comparison view as possible, we reproduce below parts of two tables from Rajan and Zingales to which we add (as a last row) our estimates for Greece in the same years[30]. On the right panel we show metrics for capitalizations over GDP and on the left panel we show the number of listed firms per million of population. Our estimates of capitalization in Greece include only equity shares.

Please Insert Table 2 about here

The capitalization-to-GDP ratios – despite the reservations that have been voiced about their comparability – show that Greece is relatively high in 1913, comparable to the US and Germany, but goes to a low level in 1938. Thus, at the peak of pre-war globalization, the Greek Exchange appears to be within the European trend, to decline later considerably due both to the general reversion of globalization and to its own particular circumstances, as we shall presently explain.

Looking at the metric of listed firms per million of population, we note that Greece remains at the low end of the comparative scale but shows a very visible growth between 1913 and 1929. In the latter year its metric is in fact comparable to that of Germany and Sweden. In the last year, 1938, the Greek ratio is somewhat lower than in 1929 but remains again comparable to that of Germany and Sweden. On the whole, it appears that the ASE was following a pattern similar to other European exchanges and that, at least in terms of listed firms, it developed a visible dynamic during the first decades of the 20th century. This dynamic will be a central aspect of our inquiry in later sections of this paper.

A more detailed comparison with the more developed exchanges of the UK and Germany can also be made, on the basis of published data, for the metrics of listed firms per million of population and IPOs per million

[30] These are extracted from Tables 3 and 5, Rajan and Zingales, *'The great reversals: The politics of financial development in the twentieth century*' pp. 15-17 and complemented by more recent data in Musacchio & Turner, 'Does the law and finance hypothesis pass the test of history?'; Greek data are calculated from hand collected evidence on stock capitalizations and available sources for GDP and population, as per Appendix A.

of population. In figure 2 we show the comparative estimates for the period 1900-1925 (Appendix B shows the detailed data).

Please insert Figure 2 about here

The left part of the diagram confirms that the ASE was comparable to Berlin in terms of the density of listed firms, but both were much lower than London. On the right part of the diagram where IPO densities are compared however, the ASE is located below the others throughout the period. Thus, the scarcity of IPO activity on the Greek Exchange, relative to what is observed in the more developed exchanges is a basic observation to occupy this analysis in later sections. Possible factors that we take up in later discussion are related to liquidity conditions but also to questions of transparency and regulation of the quality of IPO activity.

C. Exchange Governance and its Successive Reforms

From a governance standpoint, the Exchange remained a self-regulated organization until 1918, when a landmark law imposed government interventions[31]. Law 1308 of 1918 was inspired from analogous legislation of the 1890s and 1900s in civil law jurisdictions, mainly Germany, France and Italy; its timing was clearly related to the occurrence of a very large Stock Exchange bubble in 1918 and the rapid increase in speculation that had followed the end of the war. The new law brought about an overhaul both of legal status and operating procedures. The Exchange became a public legal entity and was granted a monopoly on legal transactions of shares and bonds, following earlier French and German arrangements. Other provisions covered brokers' duties, clearing and settlement, types of transactions, including cash, forward, option and repos. The law additionally introduced, for the first time, penal sanctions for misinformation, frauds and abuse of investors' trust[32].

Law 1308 established direct government intervention in Exchange affairs; the government acquired major powers not only for oversight but also in decision-making. An inspector's office was installed for supervision of the rules of trading, the power to suspend Exchange operation for up to five days. An 'Exchange Council', separate from the Exchange's governing board, was constituted; its composition included public servants, bank representatives and brokers, the latter being a minority. The Council wielded powers over policy, broker licensing, listings and delistings (to which we return below). The Secretary General of the Ministry of Economy chaired it[33]. The Council represented severe curtailment in the power of brokers, removing from their control two decisions of strategic importance: broker licensing and securities' listing.

Ten years later, a new law - Law 3632 of 1928 - was passed revising governance structures, rules and operations[34]. As was true at the time of the Exchange's original founding in 1878, this was also a period of major

[31] Papadimos, 'Collection of Stock Exchange Law', Law 1308 of 1918.
[32] Law 1308 of 1918, articles 33-34 Papadimos, *'Collection of stock exchange law'*, pp. 36-37.
[33] Law 1308/1918, articles 3-5.
[34] Gounaropoulos, 'Stock Exchange Law', Law 3632/1928.

change in financial architecture in Greece and in the country's adherence to international monetary arrangements. In May 1928, Greece established a new central bank, the Bank of Greece, which took over responsibility for monetary management; Greece committed to the gold exchange standard at the same time. The prospect of regaining full participation in the international monetary system and a new opening to the international economy provided the impetus for modernization of the Exchange[35].

The 1928 law maintained the government inspector clarifying his responsibilities vis-à-vis the governing board of the Exchange that was made up of broker-members. Importantly, the Exchange Council that had been established in 1918 now assumed powers of final decision in matters that had earlier required Ministerial or Cabinet approval. In that sense, the new legislation 'depoliticized' the decision process and allowed speedier decision-making. In the same spirit, a special 'Exchange Court' was established which would rapidly adjudicate differences, claims and frauds arising from transactions both among brokers and between brokers and clients[36]. The explicit justification for instituting this court was the need for speedy resolution of disputes, which was impossible to achieve in the regular courts[37]. The penal sanctions for market abuse came under the jurisdiction of the special court, and this improved speed of enforcement. The law rebalanced the governance, re-expanding Exchange autonomy in areas that had been relegated to government decision in 1918, such as licensing, listing and brokers' disputes.

A brokers' Guarantee Fund, whose primary form had been already established in August 1923, was now fully organized as a collectively financed self-insurance fund for brokers. Its express purpose was to cover obligations to other brokers in case of a broker's default and to compensate investors. The Guarantee Fund has proved a stable arrangement that survives to this day.

The reform of 1928 sought to improve both the efficiency and the credibility of Exchange operation. The provisions on speedier enforcement of market abuse prohibitions and of the compensation scheme for investor losses due to broker failures formed the first cohesive framework for investor protection in Greece.

D. Listing Requirements

At the beginning of its operation the Exchange instituted and followed two basic listing conditions for shares of private companies. The first was very specific: at least one third of the company capital had to be paid up. This ensured credibility for original owners but was also an anti-speculative device against the sale of empty shells on the Exchange floor. It was not required to conduct a public offer of shares to obtain listing. There was however a second condition for listing: a general provision that shares must show potential for trading activity[38]. The determination of this potential was left to the governing board of the Exchange, based on evidence furnished by the

[35] The next landmark reform of the Exchange would come in the 1990s, at the time of preparation for Greece's entry into the euro-zone.
[36] The Exchange Court was a mixed forum of one senior broker, public servants and two judges; its jurisdiction included brokers' and investor claims, see parliamentary Introduction of Law 3632/1928, Gounaropoulos, '*Stock Exchange Law'*, p.9.
[37] Gounaropoulos, ibid. and Parliamentary Introduction of Law 3632/1928.
[38] Stock Exchange Organizational Charter (1879), article 12, Platanopoulos, *'One Hundred Year of the Athens Stock Exchange'*, p.37.

candidate company. Besides papers certifying its legal status and some form of financial statements, tradability could logically be established on only two grounds: (a) evidence of the actual dispersion of ownership before listing; (b) actual trading in the lively informal market which was in operation at least until the 1920s. It is highly probable that evidence of off-market trading was acceptable in the early years, since the 'free market' was legitimate until 1918, when the Exchange acquired the legal monopoly of transactions in shares.

A far-reaching innovation included in Law 1308 of 1918 was the change in listing requirements and procedures. As compared to the previous constraint of a minimum percent of paid up capital[39], the size of capital now became a prerequisite for listing. In addition, companies were required to have published at least two annual financial statements prior to the time of listing if their capital exceeded 2 million drachmas (80,580 gold sovereigns), and one set of annual financial accounts if their capital exceeded 5 million[40] (201,450 gold sovereigns). Thus, larger capital size was accepted as a criterion of quality. With regard to financial statements, the law made no mention of either accounting standards or audits. Nevertheless, the fact that financial reporting was elevated to a legal prerequisite for listing boosted the accounting process and the accounting profession.

The size criterion acted as a double-edged instrument: it encouraged large firms, even if they were newly formed ventures, to seek listing. The earlier requirement of evidence of tradability did not appear in Law 1308. It would be inconsistent for a law that instituted a legal monopoly of Exchange transactions to require evidence that implicitly admitted the function of the informal market.

The same Law of 1918 took the power of listing (and delisting) decisions away from the governing board of the Exchange, i.e. the brokers. The Exchange Council (constituted as described in the previous section) assumed the responsibility to propose listing for Ministerial approval. This represented a politicization of listings that would be severely criticized both in terms of slowness of process and for governmental meddling[41]. In the parliamentary proposal for this law, it was generally accepted that the government could assure the elimination of speculative excess[42].

Ten years later, Law 3632 of 1928 revised again listing requirements for shares. The size of capital required for listing was raised to 5 million drachmas (13,427 gold sovereigns) and annual financial statements for at least three years prior to listing were mandated; however companies whose capital exceeded 10 million (26,852 gold sovereigns) were allowed to present only one year's financial accounts. The increase in capital size was only nominal. In gold sovereign terms (see also Appendix G) the change in required capital represented a substantial reduction in real terms. This accords with evidence we present in sections IV.A on the size of companies being

[39] Burhop, 'New Stock Issues in Germany, 1882-1892' provides an interesting example on the significance of paid up shares. Specifically between 1870 and 1884, the minimum face value of a share was 300 Mark and only 40% of it had to be paid up before the IPO. This means that the minimum investment to buy one share was 120 Mark. The 1884 corporate law increased the minimum face value of a share to 1,000 Mark and an IPO was only possible for fully paid-up shares.
[40] Law 1308/1918, art.18, Papadimos, *'Collection of Stock Exchange Law'*, p.74.
[41] See Parliamentary introduction to the later Law 3632/1928.
[42] Parliamentary introduction to Law 1308/1918, Papadimos, ibid.

listed in ASE. In addition, candidate companies had to provide information about their shareholdings and their history of capital increases prior to listing[43]. Thus, evidence of dispersion of ownership and tradability made its way back onto the complement of listing requirements. Law 3632 of 1928 rebalanced the power of decision over listings. It vested the Exchange Council with decision-making authority for listings, abolishing direct ministerial power, but maintaining at the same time the limits on brokers' influence. The Council became a 'listing authority' that could act speedily and expertly on admissions to trading. It is worth repeating that, like its predecessors, this more sophisticated law included no explicit regulation of public offers of shares. The conduct of public offers continued to be unregulated until after the Second World War.

III. Exchange Listings and IPOs 1880 to 1940: The Impact of the Environment

A. The Comprehensive Data

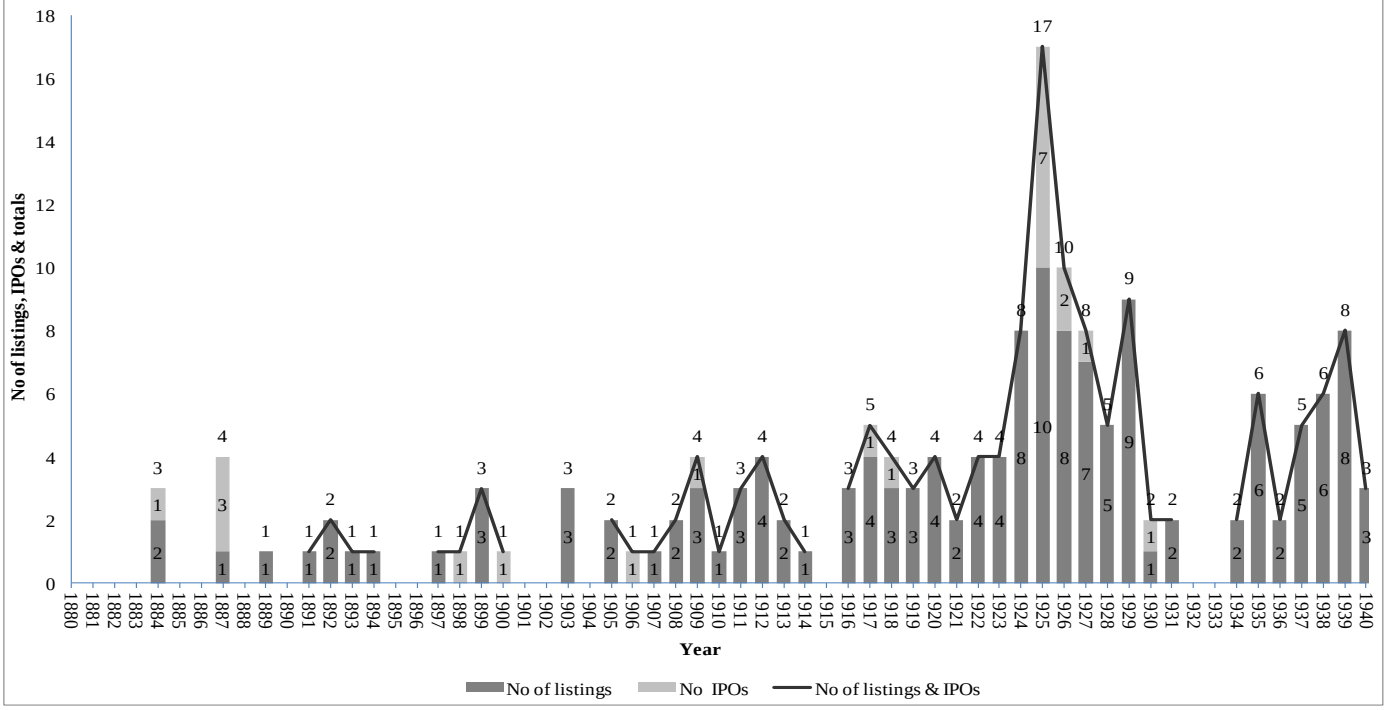
Using archival data from the files of the ASE and the National Bank of Greece, press reports and Exchange bulletins we have put together Table 5 that shows new listings and initial public offerings of equity shares in the years 1880-1940. In Figure 3 we show number of listings and IPOs per year.

The data in Figure 3 show two general characteristics. The first is that listings by far exceeded IPOs throughout the period. Over the 60 years (1880-1940) there are 165 new listings of companies and of those only 21 conducted concurrent IPOs. Thus, market development was based on listings, primarily. Secondly, there is a strong movement of ebb and flow over the years in the process of listing. There are periods of little or no listing activity and other periods with a rapid pace of new listings. Finally, we note that 1925 is an 'outlier year' when both listings and IPOs were very numerous compared to the entire period. We come back to this in section VI.

It is important to note that visible jumps in listing activity preceded the changes in listing requirements in 1918 and 1928. Both major legal changes in 1918 and 1928 occurred after episodes of rapid price increases that were followed by subsequent rapid declines. So legal changes occurred in the midst (or towards the end) of periods when listing activity was strong and continuous. Our basic observation is therefore that development was not led by legal change but rather by an autonomous demand for listings. Demand for listings was linked to economic conditions and expectations. In fact, the economic and political environment was in constant turmoil. Over the sixty years from 1880 to 1940, Greece was embroiled in two world wars, four local wars and two sovereign bankruptcies. It also experienced remarkable periods of growth. It is impossible to gain an understanding of the movement of listings and IPOs without a broader history review, since shifts were not random but, to a large extent, historically conditioned.

[43] Art. 19 of Law 3632/1928 see, Keramidas, '*Stock Exchanges'*, p.36.

Figure 3. No of Listings, No of IPOs & Total no of firms launchd on the ASE during the period 1880-1940



Before embarking on the historical review we must ponder the distinction between listing with and without a public offering of shares, as this is a dominant characteristic of the data in Appendix B. The question is what incentive was there to list, if immediate access to external equity finance was not sought simultaneously. The question becomes even sharper if we recall that the Exchange was not a monopolistic trading venue but coexisted and competed with the 'free market' for more than half the period. If listing simply meant access to trading liquidity for company owners, the 'free market' was available and apparently quite active. So what would a firm gain by listing (but not raising capital concurrently) on the Exchange?

Two conjectures fit the qualitative evidence. First, the attainment of listing requirement was a reputational signal for the company being listed, since successful examination by Exchange authorities offered a type of 'certification', something that could not exist for the 'free market'[44]. Second, companies that obtained listing could exploit their new visibility to proceed to subsequent capital increases by secondary offers, after establishing a track record on the Exchange. This implies that listings were not 'stand-alone' decisions but part of a process at the end of which external equity capital was indeed raised[45]. Contemporaries also noted that listings at times of high inflation enabled inflation adjustment to company capital. Indeed, for a large portion of the period under study

[44] The certification function is normally attributed to underwriters in the modern literature. In the context of the Greek market no formal underwriting arrangements have been recorded. Listing and tradability of shares could also increase their value as collateral for borrowing from banks.

[45] See Appendix D below for data on capital increases that took place soon after listing. See also Derrien and Kesckes, 'The Initial Public Offerings of listed firms'.

inflation was high. In any case, although listing was not contemporaneous to an offer of new shares, it could act as a precondition to one. In addition, the low liquidity in the overall economy must have also contributed to this result.

In this connection, the benefits of Exchange listing include the condition that access to the market trading facilities subsequent funding, supports the creation of a market for the company's shares, boosts liquidity and broadens the shareholder base[46].

B. The period of rising globalization: 1880-1913

Although Greek history has many turning points in the period of study, it is useful to follow an internationally accepted periodization: The period is divided in two parts using 1914, the year of outbreak of WWI, as a dividing point. The first period, 1880-1913, includes the years of rising globalization. The second period, 1914-1940, includes war years, post-war adjustment and the crisis of the 1930s[47]. In this and the next section we provide a history review for Greek developments, in order to underscore particular aspects that, beyond the international trends, conditioned the development of the Exchange, and more particularly listing activity.

The last twenty years of the 19th century witnessed a great cycle in Greek economic fortunes. In 1878 Greece had, as said, regained access to international markets and a large inflow of borrowed funds occurred, giving a visible boost to liquidity, investment and general economic activity. The 1880s saw the launching of major infrastructural projects, railroads, roads and the Corinth Canal, leading to feverish construction activity. Several of these very visible projects were included in the list of early IPOs conducted on the Exchange, as we shall see presently.

The increasing burden of public debt and the intensification of military spending however, produced a fiscal crisis in the late 1880s. International lending also became much restricted after the Baring Crisis and the Argentine default in 1892. Greece followed, defaulting in 1893. In the ensuing years the drachma devalued substantially and import tariffs were imposed, eventually boosting domestic production and exports. However, war with Turkey broke out in 1897 with disastrous consequences: besides the demoralization of defeat, Greece undertook heavy reparation payments to Turkey. The country's public finances were placed under International Financial Control in 1898[48].

In the years after the sovereign default, protection and devaluation had a positive impact on domestic production. The reflection of these movements is observable on the ASE and a changing composition of listings in the early years of the twentieth century.

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[46] Flandreau, 'Bonds and brands: Foundations of sovereign debt markets, 1820-1830'.
[47] O'Rourke and Williamson, 'Globalization and history, the evolution of nineteenth century atlantic economy' and Berend 'An economic history of Twentieth Century'.
[48] On the IFC see Dertilis, *'History of the modern Greek state 1830-1920'*, pp.575-78 and Newspaper 'Tychi' [Fortune], May 1st, 1898 and June 1st,1898.

New listings on the Exchange were quite numerous in the 1880s and the 1890s with eight listings in the first and ten in the second decade. In the 1880s, the characteristic was the promotion of infrastructure investments and military production: of eight companies listed, three were railroads two were construction firms and one was a powder and explosives company. In the 1890s listings were more diversified reflecting the acceleration of domestic production: listed companies were active in energy, shipping, textiles, machine tools. Thus, we observe the first appearance of 'industrial stocks' on the Exchange. The largest company listed during this period, was a bank, the Bank of Athens. In these two decades, and as compared to 15 new listings, there were 5 IPOs. They reflected the trends of the time: a munitions manufacturer, two railroad companies, a bank and a company managing public land rents.

The years following international financial control of public finances represent one of the most turbulent periods in the country's economic history. Fiscal adjustment was gradually achieved and the drachma followed a path of revaluation in the early years of the new century, reaching parity with the golden franc and maintaining this parity until 1918. The balance of payments improved especially with the emergence of remittances from emigrants and shipping, which constituted a fresh source of domestic liquidity[49]. The country regained confidence with new and more technologically advanced firms making their appearance, and showing up in Exchange listings, as we discuss presently. Spearheaded by an officers' revolt in 1909, a new government promoted broad modernization in an open-economy context. It would be fair to characterize the first decade of the twentieth century as a period of peace and recovery with fiscal and monetary stability. This would soon change however.

With new confidence vis-à-vis the Ottoman Empire, which was disintegrating, Greece went to war in 1912-13 and the victorious outcome saw a doubling of its territory to the north and the south (with the union of Crete) and a near-doubling of its population[50]. This signified a large extension of its internal market, a factor that would play a significant role in the ensuing period.

The Stock Exchange experienced a boom during this period, in the years 1904-6, when recovery and currency revaluation had entrenched themselves[51]. Leading sectors in the listings were banks, steamship companies, cement companies and the first Greek electric utility. Steamship companies represented the most export-oriented sector of the time. Overall, the decade of stability (1900-10) saw the foundation of larger companies, undertaking new investments and seeking greater efficiency.

As a notable feature of quickened listing activity, new banks were systematically emerging. One factor was the large increase in inflows of foreign exchange in the form of remittances from recent Greek emigrants and from shipping. These provided a new source of private liquidity. Foreign private investments also made their appearance

[49] See Repoulis 'A Study and Law Proposal on Emigration'; Riginos, *'Conjoncture et Industrialisation en Grece 1900-1940*', pp. 125-14.
[50] A distinct peculiarity of Greece as a nation-state in the 19th century was that most ethnic Greeks lived outside its borders. Thus expansion was pursued as a goal of 'liberation' and national integration.
[51] 'Oikonomika Chronika' (Economic Chronicles, 1904-6) See Appendix G on currency revaluation in years 1900-1910.

during the decade, directed especially to new banking ventures[52]. Arguably, the listing of banks was an indicator of the broader entrepreneurial climate in the Exchange and the economy. In 1900-1913 there were 24 listings and only three IPOs. All three were conducted by new banks (Bank of Crete, Bank of Anatolia and Commercial Bank) and occurred before 1910.

C. The period of wars, the 'roaring twenties' and world crisis: 1914-1940

Greece joined the Entente in WWI and obtained further territorial gains. The period of 1916-19 was, despite the war, one of economic optimism for the future of an enlarged nation. However, the war for Greece did not end in 1918. The country became embroiled in war with Turkey in Asia Minor in 1920 ending in defeat for Greece in 1922. That defeat brought another kind of expansion: almost a million and a half of Asia Minor Greeks were forced to move to Greece as refugees. This huge and sudden 'population shock' was initially debilitating and had dire fiscal consequences, coping with a huge resettlement effort. The ten years of almost continuous war had, as expected, forced new fiscal imbalance, monetary financing of budgets, drachma devaluation and inflation of the order of 8-55 percent annually in the period after the war.

Inflation and domestic demand dominated the motives for company formations and listings, in this period, devaluation and trade protectionism boosted the emergence of enterprises that catered to the domestic market and this happened inevitably during the ten-year period of Greek engagement in wars.

The 'population shock' of 1922 was experienced as a disaster by the uprooted but became a sort of growth engine for the economy. Asia Minor Greeks were skilled and enterprising, and they soon sought new ventures in their new home. Furthermore, public spending (including foreign aid) on refugee assistance expanded domestic demands for food, clothing and housing. After the end of the wars, the pace of growth picked up; 1923-29 was a distinct episode of rapid development in recent Greek history. Inflation also continued but was on the whole much lower than the earlier decade, averaging an annual rate of 13 percent in the years 1924-27[53]. In 1928 Greece, under pressure from international donors, undertook monetary stabilization, pegged the drachma to the British pound sterling (which adhered to the Gold Exchange Standard) and created a central bank, the Bank of Greece, to oversee and execute monetary policy[54]. Once again Greece became a full participant in the international monetary system, except that the system itself proved short-lived.

The 1929 crash in the New York market ushered in a period of general financial crisis and depression. On September 21, 1931 the pound sterling went off the gold standard and the Greek government closed down the Exchange and all trading in foreign exchange. In April 1932, Greece itself abandoned the gold exchange standard and declared official default on its public debt. The Exchange did not reopen until December of that year. Following most advanced countries Greece instituted once again protectionist measures. The crisis was not as harsh

[52] Kostis, 'History of the National Bank of Greece 1914-1940'.
[53] Riginos, M., *'Conjoncture et Industrialisation en Grece 1900-1940'*, pp. 136-141.
[54] Bank of Greece, 'The first fifty years of the Bank of Greece,1928-1978'.

in Greece as in most advanced industrial economies. Under the protectionist regime, the economy picked up and local manufacturing was energized[55]. This moderate but upward economic trend would be finally interrupted with the eruption of the WWII in 1939[56].

In the 1920s, especially after 1924, the Exchange experienced another boom and an unprecedented record in new listings. In total 71 companies were admitted to trading in this period, of which most prominent were banking firms with 15 listings, textiles with 12, construction with 8, chemicals and food each with 7 new listings. This listing activity represented about 50 percent of all listings since the Exchange's inception and would not be encountered again until postwar booms in the 1970s and the 1990s. In the ensuing decade of the 1930s, new listings would continue but at a much reduced pace, with 33 new admissions to trading, with textile firms covering about one third of that number. A very interesting feature of the 1930s was that the financial stabilization of the late twenties and the financial crisis of the thirties led to the failure or merger of many of the new banks that had emerged during the boom of the 1920s[57].

As compared to the record 104 new listings in this sub-period, 11 IPOs were conducted. All of those took place until 1930 and a long stoppage in IPO activity ensued that covered the whole decade of the 1930s. Nine IPOs represented offers of manufacturing stocks, one was conducted by a construction company and one by the newly established central bank. This is the period of the clear rise of industrial finance through the Exchange. Aside from this significant shift however, the number of IPOs as a proportion of total listings actually declined as compared to earlier periods[58].

Please Insert Figure 4 about here

Figure 4 shows a comparison of listings and IPOs, along with their sectoral composition, of the two subperiods. The large growth of listings in the second sub-period is accompanied by a visible increase in the sectoral diversification. This is mostly, a diversification that encompassed the rise of manufacturing firms.

D. Hypotheses on new listings and Greek economic change

Our general conjecture that listing activity on the Exchange was conditioned by growth expectations and prospects, lends itself to statistical testing with plausible explanatory variables, available for Greece. We utilize new listings as percent of total listings (NLTL) as our dependent variable. The hypothesis about its determining factors is that indices of economic state and change affect listing activity[59].

[55] Kostis, 'History of the National Bank of Greece 1914-1940'.
[56] Bank of Greece, ibid.
[57] We have recorded nine de-listings of banks in the 1930s.
[58] Although IPOs were sparse, capital needs were actually huge. Funding through the Stock Exchange during the 1920s took place in the form of capital increases conducted by already listed companies. This strengthens our conjecture that listing was sought as a precondition for later capital gathering through sale of seasoned stocks. See section E for specifics.
[59] Doidge et al., 'The U.S. Left behind: The rise of IPO activity around the world' use GDP growth in a similar connection relating to IPO activity'.

Available Greek data are GDP and population, the breakdown of GDP into primary, secondary and tertiary sector outputs and the rate of drachma devaluation; we compute per capita output (GDPpc), output growth rates (G1, G2, G3) for the economy, the secondary (manufacturing) and the tertiary (service) sectors respectively; devaluation is estimated by the annual change in the exchange rate of the drachma to the gold sovereign.

Each of the three estimated variables represents economic conditions. Per capita GDP can proxy for disposable income and the potential demand for stocks; growth rates represent expansion of economic opportunities. The currency devaluation can proxy for prospects for profit expansion of domestic manufactures. All three can potentially be positive drivers of new listings. We form a simple time-series model to test our hypothesis.

$$NLTL = c + \alpha\,(GDPpc) + \beta\,DEV + \gamma\,(G) + \varepsilon \qquad (1).$$

According to the hypothesis $\alpha, \beta, \gamma > (=) 0$.

We explore the differentiation of this model across the two subperiods. As we have already explained, in the first subperiod the Exchange was more open to international influences but in the second, it was inward – looking, with firms primarily oriented towards the internal market. As a consequence, we expect that domestic growth played a differential role in listing activity in the second subperiod, as compared to the earlier one.

The findings from the estimation of this regression are presented in section VI below.

IV. Listings and IPOs: Frequency, Size and Quasi-IPOs

In this section we present quantitative evidence on listings and IPOs, as they evolved over the 60 years under study. We address two related research questions. The first relates to size and age of the firms admitted to listing. Did the Exchange evolve towards a trading venue for small and/or young firms or did it remain the mainstay of established insiders? From a broader perspective this is relevant to the contribution of the Exchange to enterprise development and economic change.

The second question relates to whether simple listings were actually 'IPOs in waiting', i.e. listings that were quickly followed by a capital increase. The critical issues in this question are visibility and disclosure. If IPOs were rare because disclosure was inadequate, capital increases after listing could act as near-substitutes, after the firm had shown a track record on the Exchange. We collect data on all cases where a listing was followed, within a period of two years, by an issue of new shares. We consider these as 'quasi IPOs' and compare them to actual IPOs and their features. The inclusion of 'quasi-IPOs' offers a more accurate assessment of the role of the Exchange in the financing of firms considering, that pure IPOs may have been avoided due to the persistent lack of IPO regulation and mandatory disclosure.

A. The size and age of listed companies

Given the multi-faceted economic conditions during the long sixty years that we described, the examination of basic features acquires significance since it allows an evolutionary perspective. We saw that in the early decades there was emphasis on infra-structural projects, which were necessarily large, visible and government-promoted. Manufacturing came later and its growth was largely spurred by expanding domestic market potential. As the type and scale of undertakings by firms changed we expect changes in size overtime.

In the case of simple listings, we measure size by the nominal value of the stock at the time of listing. In the case of IPOs we measure the magnitude of the actual offer, defined as the number of shares offered times the offer price. Age is uniformly measured as the number of years between the founding of a company and the time of listing.

Table 3 shows the means of size and age for both simple listings and IPOs. In panel A, the estimates are shown for the whole period. In panels B-C the estimates are shown for each sub-period.

Please insert Table 3 about here

We first note that the average size of IPO offerings exceeds by far the average size of firms that obtain simple listing. This is easy to interpret: IPOs were necessarily used when capital needs were high and could not be satisfied by recourse to narrow networks of capital providers or private resources of original owners. Thus, within the IPO dataset there are a few very large placements. Yet, as already noted, listings by far exceeded IPOs in number, the latter being a small minority. Looking at the sub-periods, we note that whereas in the early period 1880-1913, IPOs represented almost 20 percent of all new listings, in the subsequent period the share of IPOs fell to about 11 percent. We conclude that the growth of the primary market was stunted and did not keep pace with the general and considerable expansion of the market as a trading venue. This brings forth the importance of the quasi-IPOs that we take up in the next section.

The estimates in Panels B-C show a clear tendency for reduction in size over time, both for simple listing and IPOs. This is consistent with the conjecture that new sectors and smaller undertakings were gaining access to the Exchange over time. At the same time the average and especially the median age of listed firms were relatively low (3-5 years) and did not show considerable change over time. Thus, we conclude that the Exchange was not the mainstay of established insiders but a venue for trading shares of smaller and relatively young firms. This is not unexpected in a small and relatively young country in an early stage of development.

B. IPOs and Quasi-IPOs

We characterize as a quasi-IPO the case where a firm announces a capital increase soon after listing, offering sale of new shares for cash. If the time of the capital increase is indeed close to that of listing, the strategy comes close to this being a delayed IPO, rather than a truly ‘seasoned’ offering. We must recall that in the Greek

context underwriting was not a developed institutional arrangement with all the regulatory requirements of the present day. The primary sale of shares was unregulated and issuers were the main decision-makers. Disclosure quality at the time of listing was probably low. The function of certification, which in the modern literature is attributed to underwriters, was vested in the seal of approval offered by the listing authority itself. Thus a quasi-IPO would benefit from both the certification of the listing decision and the acquisition of visibility through trading. Unfortunately, there is little or no evidence of trading activity, so it is not possible to distinguish firms which acquired a trading track record quickly after being listed. Instead, we have imposed a reasonable time limit of two years as a period during which some trading record is acquired but also in which the listing certification retains validity as a reputational asset. Listed firms which engaged in capital increases within two years of listing are here considered as quasi-IPOs. Appendix D includes a list of quasi-IPOs that took place over the period.

In Table 4 and Appendixes D and E we show descriptive statistics for quasi-IPOs and IPOs for the whole period and by sub-period. Size now describes the size of the offer in all cases. Data are classified by the date of listing, not by the date of ensuing capital increase in the case of quasi-IPOs.

Please insert Table 4 about here

As shown in Table 4, 42 quasi-IPOs were performed over the period, double the number of IPOs. However, total capital raised through these quasi-IPOs amounted to about 1.6 million gold sovereigns, less than half the aggregate amount raised by IPOs (3.5 million gold sovereigns). Thus, it appears that quasi-IPOs were chosen smaller under-takings; these cases were probably more needful of the certification and the visibility provided by an Exchange listing, before attempting to raise funds. The relation of IPOs and Quasi-IPOs is strongly reversed over the two sub-periods, as we observe from panels B and C of the Table 4. During 1880-1913, quasi-IPOs were fewer than IPOs and smaller in terms of capital raised. On the contrary, in the period 1914-1940, quasi-IPOs were far more numerous than IPOs, and, although they represented smaller offerings on average, they led to about the same total capital absorption as IPOs. In an era when smaller and younger firms were admitted to listing, the implied usefulness of listing as a certification mechanism was clearly stronger. Thus, one conclusion is that especially smaller firms used Exchange listing as a precondition for raising funds after having gained access to market trading. This implies that the supply of securities in actual IPOs understated the true demand for capital by new firms and this demand became manifest shortly after listing, for smaller firms. Listing itself as a 'certification' signal facilitated the supply of new capital in an environment in which mandatory and uniform disclosure requirements were not enforced.

V. Was there IPO underpricing on the Athens Stock Exchange?

A. Theoretical Justifications

The underpricing of primary offerings of securities has been extensively researched in modern markets, both developed and emerging[60]. The phenomenon of placements, where offer prices are systematically lower than subsequent trading prices, has drawn much attention because it constitutes an anomaly within the framework of efficient markets. This anomaly has spurred a large amount of research both in theory and history.

Theoretical explorations of underpricing have revolved around several basic themes. Ljungquist[61] has reviewed theories, focused either on the demand side or the supply side of primary markets: Demand theories devolve on the asymmetry of information between issuers and external investors, on one hand, and behavioral factors summarized into the concept of 'investor sentiment', on the other. Supply theories are underpinned by institutional factors (e.g. law, regulation, financial practices) and/or strategic theories (e.g. controlling the ex-post shareholder base). Recognizing that regulation and institutional arrangements were absent in 19th century Greece, we mostly draw on ideas from demand theories. Asymmetry may lead to an underpricing equilibrium in a market with uninformed investors. Investor sentiment presumes over-enthusiasm of buyers in the after-market of the offering. In fact, both aspects can be linked since the appearance of sentiment is more likely when asymmetry of information is more acute.

Historical studies of large stock exchanges have also focused on IPO underpricing. Several studies in the 19th and 20th centuries find that IPO underpricing varied over the long term. In fact, it appears to have been either absent or very small in magnitude, in markets such as London and Berlin during the late 19th and early 20th centuries. Numerous studies[62] have noted that the increase in underpricing occurred overtime in spite of improvements in regulation, disclosure, and the prestige of IPO underwriters.

B. Pricing in the Athens Stock Exchange

The question in this section is whether underpricing actually occurred on the ASE during our period of study and if anything can be said about its determinants. In our case, the number of observed IPOs is limited to 21

[60] See Ritter, 'The hot issue market of 1980'; Ljungquist, 'IPO underpricing'; Thomadakis et. al., 'Collateral regulation and IPO specific liberalization: The case of price limits in the Athens Stock Exchange'.
[61] Ljungquist, 'IPO underpricing'.
[62] See Burhop, 'The underpricing of initial public offerings at the berlin stock exchange, 1870-96'; Chambers, 'Gentlemanly capitalism revisited: A case study of underpricing of initial public offerings on the London stock exchange, 1946–1986'; Lehman, 'Underwriter activity and performance of Initial Public Offerings in Imperial Germany between 1897-1914: The role of reputation'; Chambers, 'Going public in interwar Britain'; Fohlin 'Asymmetric information, market power, and the underpricing of new stock issues in Germany, 1882-1892'; Fohlin and Reinold, 'Common stock returns in the pre-WWI Berlin stock exchange'; Chambers, 'Going public in interwar Britain'; Burhop et al., 'Regulating IPOs: Evidence from going public in London, 1900-1913'; Lehmann, 'Taking firms to the stock market: IPOs and the importance of large banks in imperial Germany, 1896-1913'. In their seminal study of the London Exchange, Chambers and Dimson, 'IPO underpricing over the very long run'.

and so small a population can hardly support stringent statistical testing. We nevertheless marshal evidence from descriptive statistics, simple correlations and qualitative observation.

In order to measure underpricing accurately, we compare the offer price of shares in each IPO with the shares' first trading price observed from daily press bulletins. Having no estimates of a market index on a daily basis, we have undertaken a market-return adjustment as follows: for each IPO we isolate two dates: the last day of the offer and the first day of trading. Further, we draw from the daily press all shares that traded on both dates and compute a simple average return of the portfolio composed of these shares. Thus, for each IPO we have a return for a matching portfolio with the same trading dates. We use this return as a proxy for 'market return' (MPR) and compute the market-adjusted return (MAIR) for each IPO as follows:

$$MAIR_i = \frac{CP_{i,1} - OP_{i,0}}{OP_{i,0}} - MPR_i \quad (2)$$

where, $CP_{i,1}$ is the first observed trading price of the newly distributed shares of IPO i; $OP_{i,0}$ is the offering price of IPO i; MPR (i) is the matching portfolio return for IPO i. In Table 5 we present descriptive statistics of the computed MAIR.

Please insert Table 5 around here

In order to gauge possible determinants of underpricing we examine popular proxies, found in empirical work with strong theoretical justification and measurable from our data set. These include age and size[63] and the percent of given ownership by pre-IPO owners. Size and age proxy for asymmetric information between issuer and investors (older and larger firms offer better information and are less underpriced). Monitoring incentives are taken to increase with the number of shares sold by the original owner at the time of the IPO. Ljungqvist and Wilhelm (2003) show that first-day returns are lower, the greater are the monitoring incentives of the issuing firms' decision-makers.

Size is measured as the size of the offer, i.e. the number of issued shares times the offer price. Offer prices are expressed in gold sovereigns throughout. Age of the company at the time of the public offering is measured by the difference in years between the date of establishment and the date of the public offering. Finally given ownership (GO) measures the percentage of equity ownership offered to the public at the time of the offering.

From the estimates in Table 5, it is seen that, on average, underpricing is evident only in the second subperiod 1914-1940, whereas in the early years it appears that offers were overpriced. It can also be seen from the Table that in terms of possible explanatory variables, average size of offerings exhibits a dramatic decline between

[63] See Ritter, 'The hot issue market of 1980'; Megginson and Weiss, 'Venture capitalist in initial public offerings'; Ljungqvist and Wilhelm, 'IPO pricing in the dot-com bubbles: Complacency or incentives', Chambers and Dimson, 'IPO underpricing over the very long run'; Lehman 'Taking firms to the stock market: IPOs and the importance of large banks in imperial Germany, 1896-1913'.

the two subperiods. We examine simple correlations between MAIR and the three possible explanatory variables by means of univariate regressions. Results are discussed below in section VI.

VI. Empirical Analysis

In this section we present the empirical results of estimations undertaken on earlier hypotheses regarding new listings and IPO underpricing Table 6 shows the estimation of regression (4) on the determination of new listings that is repeated here for clarity.

$$NLTL = c + \alpha\,(GDPpc) + \beta\,(DEV) + \gamma\,(G) + \varepsilon \qquad (4).$$

We conduct the estimation of (1) using alternately G1, G2 and G3 (growth rates of overall GDP and of the secondary and tertiary sectors respectively) as the growth factor. We also estimate the same regressions separately for the two sub-periods. In Table 6 we show the result of estimations[64].

Please insert Table 6 around here

These results indicate that when the whole period is examined there is no strong explanatory factor on new listings. GDP growth appears as a positive determinant in one of the regressions and the rate of devaluation appears as a weak negative determinant. Looking at subperiod estimations however, we note a substantial difference between the earlier and later one. In the first subperiod no independent variable is significant. In the second subperiod however growth rates exhibit significance, especially the growth rate of manufacturing emerges as the more positive and significant factor. This provides statistical confirmation to our qualitative conjecture that, in the second subperiod, exchange development was energized by the expansion of Greece's internal market.

The next set of estimations is a series of correlations represented as univariate bootstrapped regressions. The small size of the population of IPOs remains of course a barrier to statistical testing of higher stringency (e.g. multiple cross-sectional regression) but our goal is to gather as many indications as possible from this admittedly small set of observations.

The following univariate bootstrapped regressions are estimated:

$$MAIR = A_1 + \beta_1\,LnSIZE + e_1 \qquad (5a)$$

$$A_2 + \beta_2\,Ln(1+AGE) + e_2 \qquad (5b)$$

$$A_3 + \beta_3\,GO + e_3 \qquad (5c)$$

[64] As there are anomalies in the time series due to zero new listings in some years, we have used the technique of «bootstrapping» to enhance the quality of estimation. This method makes use of the empirical distribution function to derive an "approximating distribution" of the observed data. This can be implemented by constructing a number of resamples with replacement, of the observed dataset (and of equal size to the observed dataset). The same method can also be used in the univariate regressions of section B, Fox, 'Applied Regression Analysis and Generalized Linear Models'.

Coefficient estimates for β_1, β_2, β_3 show the correlation of each variable to MAIR. Although general conclusions cannot be drawn about the determinants of MAIR from univariate regressions, we can at least gauge if the direction of the correlation accords with extant theory and empirical evidence. Table 6 exhibits these results.

Please insert Table 7 about here

The only observation of significance in Table 7 is that the size of an IPO correlates negatively to estimated MAIR. This is in line with a long list of findings in the literature and accords with the view that larger size (and visibility) signifies lower information asymmetry. However, neither age nor the percentage of given ownership exhibit strong correlation to MAIR, so that no indications can be gauged about these popular proxies.

Looking more closely into the composition of the data (Table 4 and Table 5), we note a striking concentration of IPOs in the year 1925. Seven IPOs (a third of the total number over the period) were conducted in that year. The average size of these IPOs was 11,090 Gold Sovereign. Their average underpricing is estimated at 301.89%, a level not found at any other time within our study period. Simple listings attained their maximum number in the same year, in which stock prices also peaked. It thus appears that 1925 was a very special year that affords a rare glimpse into a 'hot period' of the Athens Stock Exchange and Greek conditions of liquidity. In our dataset, 1925 was the first year of IPO activity after a long pause. The last IPO had taken place 7 years before, in 1918. Independent research into Greek fiscal and monetary conditions of the time indicates that the 'hot listing period' was very probably connected with macroeconomic factors. 1922 was the critical year of Greek defeat and the Asia Minor refugee crisis. Historical research indicates that the post-1922 period was one of monetary expansion and inflation that led to decreases in both the real wage and the real interest rate, thus enabling higher profitability[65]. Increasing profitability is repeatedly mentioned in contemporary press reports as a cause of the IPO boom of 1925[66].

Furthermore, 1926 marked a sharp turn (also mentioned in the contemporary press) towards restrictive monetary and fiscal policies. As Christodoulaki notes: "The timing of this change in economic performance is located in late 1925 and early 1926 when pressure to improve the fiscal performance of the government and to follow contractionary monetary policies in order to stabilize the drachma was increased"[67]. The peak in IPO activity observed in 1925 could be therefore attributed to a confluence of factors: long pent up demand, high stock market valuations and expansionary monetary and fiscal policy. It is indicative that within those conditions it was mostly small firms oriented to the domestic market that sought and gained admission to market for capital-raising. As compared to the early large IPOs of the 19th century, this represented a true reversal in primary market direction.

[65] Christodoulaki, 'Industrial growth in Greece between the wars: A new perspective'.
[66] Newspaper 'Oikonomologos' [Economist], October 23, 1926.
[67] Christodoulaki, *'Industrial growth in Greece between the wars: A new perspective*' p. 80.

VII. Concluding Remarks

The development of the ASE from its inception (1880) to the outbreak of the Second World War (1940) was an active process that went through several turns as Greek economic events passed through episodes of growth, sovereign bankruptcy, war and expansion. An important milestone for the character of the Exchange was the end of the era of globalization in 1913. The Exchange evolved from a trading venue for government paper and equities of large infra-structural government-sponsored projects to a market offering access to small manufacturing firms pursuing indigenous ventures in mostly consumer goods and construction. Thus, the Exchange underwent 'democratization' from elite large projects to grass-root private initiatives.

Over the period, the Exchange accepted 165 new equity listings, besides the mandatory listing of government bonds. The Stock market experienced several 'hot' periods of listing activity and peaking prices. In the first three decades of its operation as a trading venue, the Exchange competed with a free market that operated informally alongside the official Exchange. The fact that listing activity was robust even under the competition of a 'free' market testifies to the value of Exchange listing as a type of certification that added value and visibility to listed entities.

The Exchange's role as a *primary* market for capital-rising through IPOs was limited, however. Only 13 percent of the firms that attained listing over this long period actually performed IPOs. Another 25 percent chose to increase their capital by public offers within two years after acquiring listed status. The explanation of low IPO activity could be due initially to the traumatic effects of an IPO bubble in the 1870s, before a formal Exchange had been organized. However, even when the effects of the early bubble became a distant memory, IPO activity still remained sparse. This could be the result of insufficient liquidity in an emerging economy but was also related in our view to the lack of regulation, especially adequate provisions for disclosure and IPO quality that could inspire trust to investors.

Focusing on the parallel activity of quasi-IPOs (capital raising performed within two years of listing) we found that it was more widely used than IPOs, especially in the 1920s, suggesting this was a less costly route for capital-gathering. The difference between IPOs and quasi-IPOs was that the latter had already obtained the stamp of approval of the listing authority and had established a trading record. Hence, whereas the same amount of capital raised in an IPO or a quasi-IPO made the same demands on liquidity, quasi-IPOs offered differential levels of information about the issuer and apparently met with different levels of investor trust. This was very important given the small size and the character of firms attempting to raise capital in the post-globalization era.

It is notable that despite several public interventions in the early twentieth century on the governance structure of the Exchange, IPOs remained unregulated, investment banking services were not standardized and the quality of disclosure was low and uneven. This is probably the longer-term explanation of the relative weakness of the primary market. It must be clarified that there was no general absence of regulatory activity. Significant

regulatory changes did take place from 1918 to 1928, but they were focused on listing requirements, secondary trading and the duties of brokers, not on IPOs and investment banking.

Examining the dataset of 21 IPOs undertaken over the period 1880-1940, we note a significant change in character and composition in those as well. Whereas banking IPOs appeared throughout the period, non-financial issues shifted from infrastructure-related projects and few heavy industry undertakings to light manufacturing ventures mainly oriented to the satisfaction of domestic demand. A notable reduction in the average size over time and a visible shift to severe underpricing of IPOs around the second decade of the twentieth century are evident trends. Analysis of pricing, revealed that reductions in size, increases in market liquidity and the occurrence of 'hot market' pressure were proximate causes of the emergence of underpricing.

In a more general historical assessment it appears that the ASE showed distinct features during the two sub-periods of this study. It grew in both sub-periods. In the period of rising globalization (1880-1913) the growth was realised through listings and IPOs of larger firms mainly oriented to infrastructures and banking, as we said. In the period of de-globalization that started with the First World War, and during which Greece experienced considerable growth of space and population, the Exchange developed with a clear orientation to the internal market: small and light manufacturing firms, smaller banks and construction. Thus, the Exchange responded to the major features of economic development in Greece. The large expansion of the domestic market offered renewed impetus to listing activity of firms catering to that domestic market. This was also a response to protracted war conditions that engendered a de facto protectionism.

The second aspect of change in the post World War I and national wars period was the emergence of inflation and monetary instabilities. Our evidence shows a large increase in listing activity and IPOs in the 1920s, at a time when inflationary profits were making an appearance. These phenomena would come to an abrupt stop with restrictive policies enacted from 1926 onwards. Thus, indirectly, it appears that the abundance of monetary liquidity gave a boost to the Exchange both as a primary market and as a listing venue. This is clearly confirmed by our evidence.

Finally, it is important to note that we have found evidence that listing activity was statistically related to to growth rates of the secondary (industrial) sector in the second subperiod, i.e. the period of internal market expansion. This is a significant finding, especially in conjunction with the clear tendency for small firms to list on the exchange in the second and third decades of the 20th century. The clear implication is that the Exchange became and remained an important venue for providing trading liquidity, and eventually finance, to emerging firms, until the outbreak of the Second World War.

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Table 1: Capitalization of listed shares and bonds in the A.S.E. and number of securities for each asset category during the period 1880-1930 (calculated in the end of each decade)

This table presents descriptive statistics on governmental and corporate bonds in Athens Stock Exchange between 1880 and 1930. Specifically it provides details on capitalization of government bonds, number of government bonds, capitalization of corporate bonds, number of corporate bonds and number of listed shares

Year (end of decade 31.12)	**Capitalization of government bonds** (in Gold Sov.)	**No of government bonds**	**Capitalization of corporate bonds** (in Gold Sov.)	**No of corporate bonds**	**Capitalization of shares** (in Gold Sov.)	**No of listing shares**
1880	6.775.925	8	1.577.042	1	3.379.715	10
1890	16.882.709	7	2.981.906	1	5.938.114	13
1900	26.697.662	9	3.112.514	12	4.924.628	20
1910	20.611.488	12	5.941.822	14	12.207.369	27
1920	18.510.309	18	5.356.224	18	20.216.870	45
1930	71.819.308	33	2.483.051	18	17.926.594	101

Source: Official Bulletins and Yearbooks of the Athens Stock Exchange (various years)

Table 2: Comparative evolution of number of listed companies per million people

The number of listed companies per million people is the number of domestic companies whose equity is publicly traded in a domestic stock exchange divided by the population in millions. Sources of the data mainly come from Tables 3 & 5, Rajan and Zingales (2003) and complementarily (which are noted with *) from Table 1, Musacchio & Turner (2013)

Number of Listed Companies per million people				Stock Market Capitalization / GDP		
Country	**1913**	**1929**	**1938**	**1913**	**1929**	**1938**
Argentina	15.29			0.17		
Australia	61.74	76.92	84.88	0.39	0.5	0.91
Austria	38.72	42.62	30.06	0.76		
Belgium	108.7			0.99	1.31	
Brazil	12.43	9.85	5.17	0.25		
Canada	14.65			0.74		1,00
Chile	20.62			0.17		
Cuba	12.69			2.19		
Denmark	38.22	54.86	85.25	0.36	0.17	0.25
Egypt	16.58	13.44		1.09		
France	13.29		26.20	0.78		0.19
Germany	27.96	19.73	10.91	0.44	0.35	0.18
India	0.82	1.81	2.59	0.02	0.07	0.07
Italy	6.32	6.40	3.11	0.17	0.23	0.26
Japan	7.53	16.65	19.48	0.49	1.20	1.81
Netherlands	65.87	95.48		0.56		0.74
Norway	33.51	41.50	45.98	0.16	0.22	0.18
Russia	2.02			0.18		
South Africa				0.22*		
Spain				0.31*		
Sweden	20.64	16.36	14.93	0.47	0.41	0.30
Switzerland	61.53	67.80	55.46	0.58		
Uruguay*	15.60*			0.16*		
United Kingdom	47.06			1.09	1.38	1.14
United States	4.75	9.72	9.16	0.39	0.75	0.56
Greece	**5.81**	**15.99**	**12.78**	**0.42**	**0.21**	**0.14**
Common Law Av.*	25.80			0.55		
German Civil Law*	33.94			0.73		
French Civil Law*	28.74			0.37		

Musacchio & Turner (Business History, 2013, Table 1, p.p.531-532) introduce also some different Stock Market Capitalization index numbers in 1913 for some countries comparing with Rajan and Zingales findings: In particular, for United Kingdom the given Stock Market Capitalization index is 0.98, for United States 0.39, for Switzerland 1.23, for Brazil 0.20, for Cuba 0.33, for Egypt 0.44, for France 0.54 and for Denmark 0.86. O'Sullivan (2007) report an average of 151 number of stocks traded in NYSE in 1885, 296 in 1900, 429 in 1915, 670 in 1920, 775 in 1925 and 1,273 in 1930. The great majority of them were industrial shares (i.e. 1,033 out of 1,273 in 1930). O'Sullivan (2007) also underlines that in addition to the 151 companies that were listed in NYSE by 1885 there have been 249 firms listed in Boston Stock Exchange and 79 in Philadelphia. Further, Moody's reported an aggregate market capitalization for the country's leading trading markets of $81.97 billion at the end of 1930 ($49 billion for the NYSE; $20 billion for the Curb and $13 billion for the remaining exchanges) which suggests a ratio of 91% based on a $90.4 billion figure for GDP for 1930 [Moody's, *Manual of Industrials* (New York, 1933), appendix, p. 106].

Table 3: Descriptive statistics for Listings and IPOs

This is a comparative table showing listings and Initial Public Offerings. AGE, is the age of the company in years on the listing date. Size measures the number of new issued shares offered to the public during the IPO procedure multiplied with their offer price in gold sovereigns. For simple listing it is nominal share value in gold sovereigns. Panel A presents the statistics for the entire period. On Panel B we concentrate on the period of rising globalization (1880-1913) during which the growth was realised through listings and IPOs of larger firms, mainly oriented to infrastructures and banking. Panel C provides statistics of the period of de-globalization (1914-1940) when ASE developed with an internal market orientation

	Simple Listings		**IPOs**		
Panel A: The Whole Period, 1880-1940					
Variable	Age (years)	Size (Gold Sov.)	Age (years)	Size (Gold Sov.)	GO (%)
Mean	6.72	82,916	6	166,061	38
Median	3.5	34,578	3	16,634	33
No of Obs.	144	144	21	21	21
Panel B: Sub-Period, 1880-1913					
Variable	Age (years)	Size (Gold Sov.)	Age (years)	Size (Gold Sov.)	GO (%)
Mean	6.67	124,470	4	319,275	48
Median	3	68,793	4	201,401	35
No of Obs.	34	34	8	8	8
Panel C: Sub-Period, 1914-1940					
Variable	Age (years)	Size (Gold Sov.)	Age (years)	Size (Gold Sov.)	GO (%)
Mean	6.79	70,188	7	114,738	32
Median	2.5	26,666	3	27,723	29
No of Obs.	110	110	13	13	13

Source: Data provided in Appendices C and E

Table 4: Descriptive statistics for Quasi IPOs and IPOs

This table presents descriptive statistics for Quasi IPOs vis a vis IPOs. Quasi IPOs or 'Delayed' IPOs are those cases of listings where firms perform a capital increase, offering sale of new shares for cash, within two years from the listing date. AGE, is the age of the company in years on the listing date. Size counts the number of new issued shares offered to the public during the IPO or the Right Offering procedure multiplied with their offer price in gold sovereigns

Panel A: Comparison Quasi IPOs with IPOs (The Whole Period)						
	Quasi IPOs			IPOs		
Variable	Age	Size	GO	Age	Size	GO
Quasi IPOs	(years)	(Gold Sov.)		(years)	(Gold Sov.)	
Mean	6.90	37,655	38.34	6	166,061	38
Median	3	18,103	34.74	3	16,634	33
Min	0	542	0.63	1	1,697	6
Max	64	208,501	87.42	46	1,564,661	100
No of Obs.	42	42	42	21	21	21
Panel B: Sub-Period, 1880-1913						
	Quasi IPOs			IPOs		
Variable	Age	Size	GO	Age	Size	GO
Quasi IPOs	(years)	(Gold Sov.)		(years)	(Gold Sov.)	
Mean	12.71	81,263	48.26	4	319,275	48
Median	3	72,927	49.12	4	201,401	35
Min	2	44,515	18.36	1	60,445	14
Max	64	131,181	75.13	11	827,109	100
No of Obs.	6	6	6	8	8	8
Panel C: Sub-Period, 1914-1940						
	Quasi IPOs			IPOs		
Variable	Age	Size	GO	Age	Size	GO
Quasi IPOs	(years)	(Gold Sov.)		(years)	(Gold Sov.)	
Mean	5.74	30,387	33.18	7	114,738	32
Median	3	16,111	31.71	3	27,723	29
Min	0	542	0.64	1	6,740	6
Max	48	208,501	87.42	46	1,066,666	63
No of Obs.	37	37	37	13	13	13

Source: Data provided in Appendices D and E

Table 5: IPOs, First Trading Day IPO Returns, Size and Money Left on the Table, 1880 - 1940

IPOs are included in the table. The offer price of IPOs is the price offered during the public offering procedure. First trading price is the first closing price of IPOs or listing in the A.S.E. on the observed first trading day. Raw returns for IPOs are the difference between the offer (or listing) price and the closing price on the first day of trading and are equally weighted (EW). Market adjusted returns are raw returns adjusted by the returns of matching portfolios. Raised Funds and money left on the table are in Gold Sovereign prices. The amount of money left on the table by IPOs is defined as the difference (when positive) between the closing price on the first day and the listing price, multiplied by the number of shares sold to the public (new investors). In other words, this is the profit received by investors who were allocated IPO shares at the offer price, at first trading. It represents a wealth transfer from the shareholders of the issuing firm to these investors

First Day IPO Returns, Raising Funds and Money Left on the Table for IPOs, 1880 to 1940

Period[68]	**Number of IPOs**[69,70]	**Mean Rate (%) of First Trading Day Returns (RIR)**	**Mean Market (%) Adjusted Returns* (MAIR)**	**Size (Raised Funds - in Gold Sov.)**	**Money left on the Table (in Gold Sov.)**
1884	1	-20	-8.22	21,255	0
1887	3	-38.12	-39.16	2,383,941	0
1898	1	-34.4	-39.16	40,000	0
1900	1	-13.79	-17.88	89,600	0
1906	1	1.307	-0.072	223,357	0
1909	1	0.1	2.89	29,795	0
1917	1	30	26.64	8,943	2,682
1918	1	7.69	-0.107	50,363	3,872
1925	7	331.42	301.89	77,636	282,299
1926	2	45.45	42.22	5,530	2,680
1927	1	160	156.29	7,997	12,795
1930	1	52	75.57	537,115	279,300
Sub-Period: 1880-1913	8	-20.15	-22.49	2,787,948	0
Sub-Period: 1914-1940	13	204.66	188.54	687,584	583,628
The Whole Period	21	119.01	108.34	3,475,532	583,628

* The mean first trading day IPO returns adjusted with the returns of all other listed companies in ASE

[68] No IPO took place in years not included in the table

[69] The annual distribution of the new issues of common stocks in this table became according to the first date of entrance of a firm in the A.S.E. and not according to the time period of public offerings

[70] The IPOs concern listings of only common stocks in the Greek stock market

Table 6: New Listings in ASE and Economic Growth

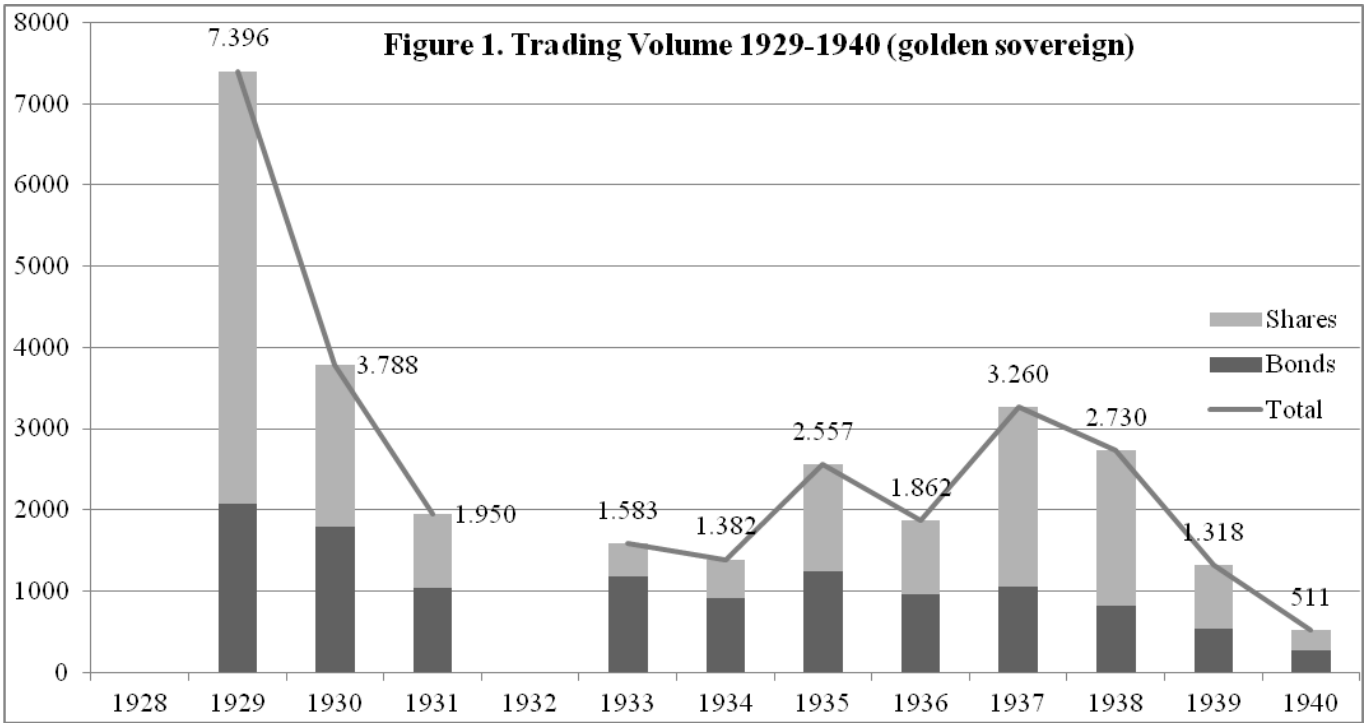
This table reports the results of multiple regressions using Economic Variables over the period 1884-1940 by employing the **bootstrapping method.** This constructs a number of resamples with replacement of the observed dataset. GDPpc is the Gross Domestic Product per capita. DEV stand for the devaluation rate. G1 is the growth rate of GDP. G2 is the rate of growth of the secondary sector (manufacturing). G3 is the rate of growth of the tertiary sector (services). ***Significance at the one per cent level. **Significance at the five per cent level *Significance at the ten per cent level

	NLTL	NLTL	NLTL	NLTL	NLTL	NLTL
Panel A: The Whole Period						
Constant	0.0818***	0.0830***	0.0839***	0.0862***	0.0843***	0.0882***
	(0.00004)	(0.000081)	(0.00002)	(0.00001)	(0.00004)	(0.00003)
GDPpc	0.000247	0.00002	0.00013			
	(0.712)	(0.970)	(0.875)			
DEV				-0.0002*	-0.000062	-0.0002
				(0.0709)	(0.734)	(0.155)
G1	0.0001			0.0002		
	(0.661)			(0.348)		
G2		0.0005**			0.0005**	
		(0.011)			(0.0354)	
G3			0.0001			0.0001
			(0.392)			(0.211)
Obs	42	42	42	42	42	42
Adj R-Squared	0.046	0.061	0.043	0.052	0.053	0.02
Panel B: Sub-Period, 1880-1913						
Constant	0.0581	0.0576*	0.0587*	0.0981***	0.0884***	0.0986***
	(0.163)	(0.0868)	(0.0845)	(0.00005)	(0.00001)	(0.000013)
GDPpc				-0.000350	0.000858	0.000202
				(0.797)	(0.637)	(0.914)
DEV	0.00544	0.00444	0.00528			
	(0.327)	(0.325)	(0.192)			
G1	-0.00005			0.0007		
	(0.961)			(0.418)		
G2		0.00101			0.001	
		(0.508)			(0.362)	
G3			0.000098			0.0002
			(0.923)			(0.866)
Obs	18	18	18	18	18	18
Adj R-Squared	0.079	0.041	0.079	0.126	0.078	0.141
Panel C: Sub-Period, 1914-1940						
Constant	0.055***	0.062***	0.060***	0.0696***	0.0736***	0.0775***
	(0.001)	(0.0005)	(0.001)	(0.00003)	(0.00005)	(0.00002)
GDPpc	0.0009	0.0008	0.001			
	(0.119)	(0.203)	(0.248)			
DEV				-0.000162	0.000041	-0.0001
				(0.242)	(0.828)	(0.482)
G1	0.000432			0.0005*		
	(0.142)			(0.072)		
G2		0.000431*			0.0005**	
		(0.079)			(0.048)	
G3			0.000064			0.0001*
			(0.664)			(0.097)
Obs	24	24	24	24	24	24
Adj R-Squared	0.060	0.024	0.032	0.050	0.042	0.052

Table 7: Results of univariate regressions for IPOs of period 1880-1940

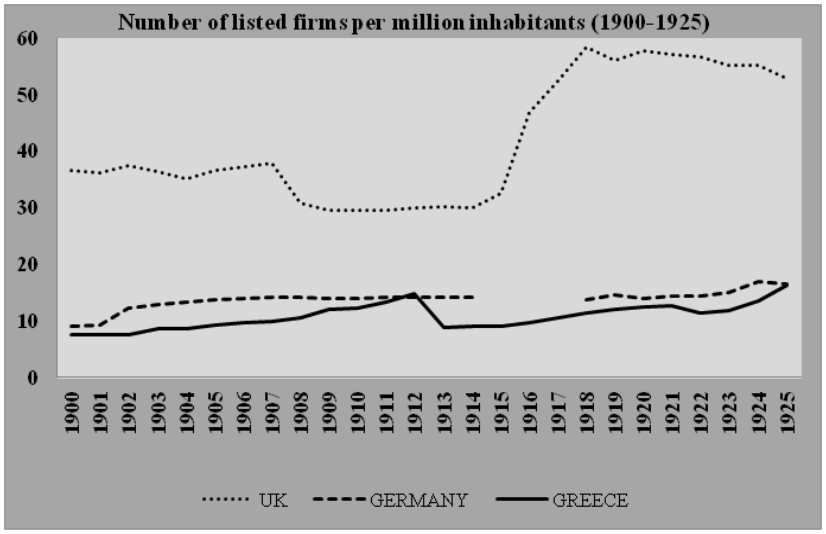
This table reports the results of univariate regressions using the dataset of IPOs launched on Athens Stock Exchange in the period 1880-1940. The dependent variable is $MAIR=(EP_{i,t}- OP_{i,0})/OP_{i,0} - MPR_i$, the IPO returns adjusted with the corresponding returns of all other listed companies in ASE that traded in the relevant days. The independent variables are AGE respectively, the log of one plus the age of the company in years on the listing date. Size is the number of new issued shares offered to the public during the IPO, multiplied with their offer price (measured by the natural logarithm). GO identifies the percent of ownership offered by listing firms to new shareholders in the IPO. The estimation results have employed the bootstrapping method ***Significance at the one per cent level. **Significance at the five per cent level *Significance at the ten per cent level

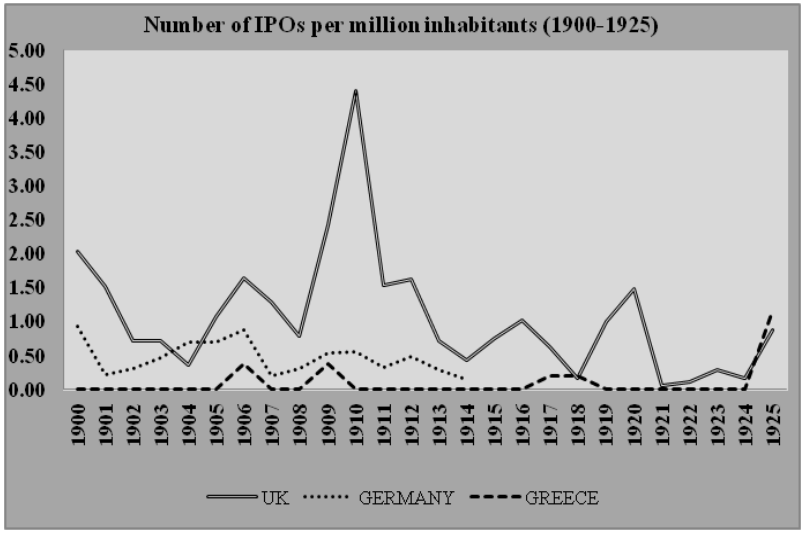
Variables	MAIR	MAIR	MAIR
Constant	0.854***	551.30*	44.48
	(0.000)	(0.054)	(0.598)
AGE	7.606		
	(0.31)		
SIZE		-45.88*	
		(0.082)	
GO			-0.29
			(0.775)
Obs	21	21	21
AdjR-squared	0.129	0.249	0.008



Source: see Appendix A

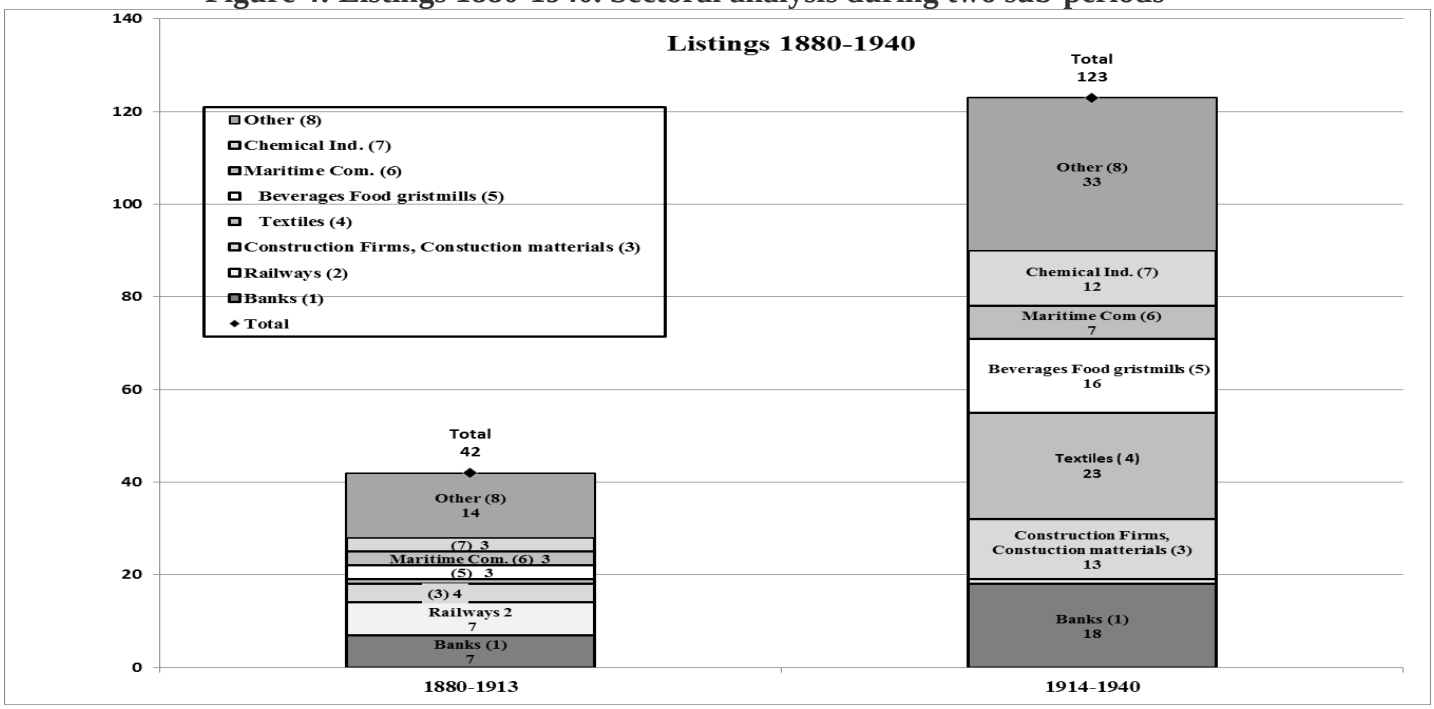
Figure 2: Number of listings and IPOs per million inhabitants (1900-1925)





Source: Data provided in Appendix A and B

Figure 4: Listings 1880-1940. Sectoral analysis during two sub-periods



Source: Data are calculated from hand collected evidence. For data source see Appendix A

APPENDICES

Appendix A: Data Sources

The main problem we have met in conducting this research is the absence of official uniform data that cover the 60-year period of the study. It has been necessary to reconstruct data series from a variety of sources. Our sources belong in three distinct categories: Bulletins and Annual Reports of the Athens Stock Exchange and the National Statistical Service of Greece; the 'industrial credit' files of the National Bank of Greece; daily and weekly press.

More specifically in the first category we have:

1. The Athens Stock Exchange's "Daily Official List" is published for the period 1920-1940. Until 1932 it includes daily closing prices of bonds and stocks. In the period 1933-1940, it also includes nominal values, number of shares and bonds listed, dividends, highest and lowest daily prices (where they exist). This source offers no data on daily volumes, unfortunately.
2. A parallel source is from the General Statistical Service of Greece which published a "Bulletin of Stock Prices" over the period 1918-1940. This includes similar data as above described in the "Daily Official List" but also from 1930 onwards it additionally includes monthly and yearly trading volumes.
3. Annual Yearbooks published by the Exchange for the years 1911, 1914-17, 1926, 1929-31. These include additional information for listed companies as of the respective year of publication: year of company foundation and year of listing, changes of company name and mergers, dividends, and capital increases.

In the second category, company files kept in the archive of "industrial credit" of the National Bank of Greece include: Board of Directors Reports, Stockholders Assembly decisions on capital increases, public offerings, dividends and financial statements.

In the third category is the economic daily and weekly press that offers data for the whole period, as follows: daily prices, dividends, public offers and capital increases, company listings and financial statements. A host of qualitative information can be gleamed from articles commenting on the state of the market, the operation of the "free market" in the early period, government policy and legal initiatives, occasional scandals and stock market anomalies. The list of daily and weekly newspapers that we have consulted consists of the following publications:

Newspaper	Period
CENTURY, (ΑΙΩΝ)	1880-1884
REGENERATION, (ΠΑΛΙΓΓΕΝΕΣΙΑ)	1880-1882
HERMES, (ΕΡΜΗΣ)	1882-1909
ECONOMIST OF ATHENS, (ΟΙΚΟΝΟΜΟΛΟΓΟΣ ΑΘΗΝΩΝ)	1883-1885, 1892-1896, 1918-1934
FORTUNE, (ΤΥΧΗ)	1893-1899, 1900-1906
ECONOMIC CHRONICLE, (ΟΙΚΟΝΟΜΙΚΑ ΧΡΟΝΙΚΑ)	1904-1916
ECONOMIC GREECE, (ΟΙΚΟΝΟΜΙΚΗ ΕΛΛΑΣ)	1902-1917
STOCKHOLDER, (ΜΕΤΟΧΟΣ)	1912-1917
ECONOMIC HERALD, (ΟΙΚΟΝΟΜΙΚΟΣ ΤΑΧΥΔΡΟΜΟΣ)	1926-1940

Appendix B: Evolution of number of listed companies per million people in London, Berlin and Athens Stock Exchanges

We follow Rajan and Zingales (2003) to calculate the number of listed firms per million inhabitants and the number of IPOs per million inhabitants. The number of listed companies per million people is the number of domestic companies whose equity is publicly traded in a domestic stock exchange divided by the population in millions. The sources for data on London Stock Exchange are from: The Times Book of Prospectuses, The Investor's Monthly Manual, The Stock Exchange Official Intelligence, Chambers and Dimson (2009), Chambers (2010), (2011), Moore (2010) and Burhop et al (2014). The data for Germany are from Schlag and Woodrich (2005), Burhop (2010), Moore (2010), Burhop et al (2012). Global Equity data are from Moore (2010)

	UK				**Germany**				**Greece**			
Period	Number of IPOs/Listed		No of IPO/Listed firms per million Inhabitants		Number of IPOs/Listed		No of IPO/Listed firms per million Inhabitants		Number of IPOs/Listed per million Inhabitants		No of IPO/Listed firms per million Inhabitants	
1900	72	1292	2.03	36.49	52	510	0.92	9.04	1	19	0	7.59
1901	57	1357	1.51	36.16	12	523	0.21	9.19	0	19	0	7.53
1902	27	1402	0.71	37.35	18	703	0.31	12.16	0	19	0	7.48
1903	27	1379	0.71	36.32	28	755	0.47	12.87	0	22	0	8.60
1904	14	1349	0.36	35.13	42	788	0.70	13.25	0	22	0	8.54
1905	42	1421	1.08	36.59	42	828	0.69	13.65	0	24	0	9.25
1906	65	1462	1.65	37.22	54	855	0.88	13.98	1	25	0.382	9.57
1907	51	1507	1.28	37.93	13	881	0.20	14.20	0	26	0	9.88
1908	32	1234	0.79	30.71	20	884	0.31	14.06	0	28	0	10.57
1909	99	1203	2.43	29.60	34	890	0.53	13.96	1	32	0.375	12.00
1910	179	1198	4.41	29.55	36	910	0.55	14.01	0	33	0	12.29
1911	63	1216	1.53	29.56	22	925	0.33	14.15	0	36	0	13.32
1912	67	1232	1.62	29.95	33	941	0.49	14.22	0	40	0	14.71
1913	30	1244	0.72	30.09	19	947	0.28	14.13	0	42	0	8.71
1914	-	1245	0.43	29.85	10	945	0.14	14.06	0	43	0	8.92
1915	-	1301	0.75	32.42	*	*	*	*	0	43	0	8.93
1916	-	1837	1.02	46.75	*	*	*	*	0	46	0	9.55
1917	4	2017	0.63	52.36	*	*	*	*	1	51	0.207	10.59
1918	-	2235	0.16	58.37	-	886	-	13.72	1	55	0.207	11.42
1919	89	2334	1.00	56.07	-	873	-	14.47	0	58	0	12.05
1920	137	2448	1.48	57.75	-	864	-	13.90	0	62	0	12.36
1921	20	2492	0.06	57.00	-	871	-	14.36	0	64	0	12.57
1922	33	2508	0.11	56.57	-	878	-	14.34	0	68	0	11.44
1923	51	2456	0.29	55.11	-	930	-	15.10	0	72	0	11.85
1924	38	2475	0.17	55.14	-	1046	-	16.88	0	80	0	13.51
1925	84	2381	0.88	52.86	-	1050	-	16.57	7	97	1.16	16.19

* Due to the First World War Berlin Stock Exchange was close

Appendix C: No of Listings, No of IPOs & Mean Prices (Trading, Listing, Offer)

Period[71]	Number of IPOs + Listings	Number of Listings	Mean Listing Price	Number of IPOs[72,73]	Mean Offer Price	Mean First Trading Price
1884	3	2	3.91	1	3.82	3.06
1887	4	1	3.00	3	8.66	4.76
1889	1	1	6.52	0	-	-
1891	1	1	6.23	0	-	-
1892	2	2	5.74	0	-	-
1893	1	1	14.64	0	-	-
1894	1	1	2.26	0	-	-
1897	1	1	5.89	0	-	-
1898	1	0	-	1	3.48	2.28
1899	3	3	6.01	0	-	-
1900	1	0	-	1	4.88	4.90
1903	3	3	5.67	0	-	-
1905	2	2	6.90	0	-	-
1906	1	0	-	1	5.58	5.65
1907	1	1	3.69	0	-	-
1908	2	2	3.68	0	-	-
1909	4	3	1.95	1	3.82	3.82
1910	1	1	16.12	0	-	-
1911	3	3	4.03	0	-	-
1912	4	4	3.97	0	-	-
1913	2	2	3.97	0	-	-
1914	1	1	3.97	0	-	-
1916	3	3	4.04	0	-	-
1917	5	4	4.06	1	4.07	5.29
1918	4	3	4.00	1	5.27	5.68
1919	3	3	4.06	0	-	-
1920	4	4	4.38	0	-	-
1921	2	2	2.94	0	-	-
1922	4	4	0.52	0	-	-
1923	4	4	0.31	0	-	-
1924	8	8	0.44	0	-	-
1925	17	10	0.54	7	0.30	1.31
1926	10	8	0.68	2	0.51	0.67

[71] No listing or IPO launched on the ASE in years not included in the table

[72] The annual distribution of the new issues of common stocks in this table has been counted according to the first date of entrance of a firm in the A.S.E. and not according to the time period of public offerings

[73] The IPOs include listings of only common stocks in the ASE

1927	8	7	0.40	1	0.26	0.69
1928	5	5	0.53	0	-	-
1929	9	9	1.28	0	-	-
1930	2	1	0.26	1	13.33	20.26
1931	2	2	0.8	0	-	-
1934	2	2	0.11	0	-	-
1935	6	6	0.40	0	-	-
1936	2	2	0.34	0	-	-
1937	5	5	0.39	0	-	-
1938	6	6	0.44	0	-	-
1939	8	8	0.70	0	-	-
1940	3	3	0.88	0	-	-
Total	165	144		21		

Appendix D: List of Quasi IPOs

This table presents statistics for Quasi IPOs on year of listing and years of right offer, offer price, trading price, number of shares and raising funds (in gold sovereign). The dataset comprises 42 companies listed in Athens Stock Exchange between 1887 and 1938. During 1880-1913 quasi-IPOs were fewer than IPOs and smaller in terms of capital raised. On the contrary, in the period 1914-1940, quasi-IPOs were far more numerous than IPOs, and, although they represented smaller offerings on average they led to about the same total capital absorption as IPOs

Panel A: Quasi IPOs

Quasi IPO	Year	Year of Right Offer	Offer Price	Trading Price	Number of Shares	Raising Funds (in Gold Sov.)
Public and Municipal Works	1887	1889	3.28	4.78	15,000	49,155
Hellenic Metal. Company	1905	1906	3.62	2.95	15,000	54,328
Wines and Spirits Co.	1909	1911	4.52	5.41	29,000	131,181
Chemicals products and Fertil. Co.	1911	1912	4.58	5.47	20,000	91,526
National Steam Navigation Co.	1911	1911	4.17	5.36	28,000	116,870
Titan Cement Co.	1912	1914	4.45	4.90	10,000	44,515
Aliveri Mines Co.	1917	1918	4.63	5.52	45,000	208,501
Agyra General Trading House	1917	1917	4.07	3.51	5,000	20,325
Piraeus Bank	1918	1918	4.03	9.40	20,000	80,580
Hellenic Mining Company	1918	1918	4.03	4.59	11,700	47,139
Piraeus Enterprises Co.	1918	1918	5.04	6.42	2,500	12,590
BIO General Industrial Co.	1920	1920	2.94	4.02	15,000	44,027
General Bank of Greece	1921	1923	0.84	9.28	8,000	6,746
Hellenic Tobacco Company	1921	1922	0.90	1.12	20,000	18,013
Central Bank of Greece	1922	1923	0.67	1.38	35,000	23,613
Oropos Mining	1922	1924	0.61	1.20	30,000	18,192
Greek Woolens Manuf. Co.	1922	1923	0.76	1.08	20,000	15,180
Kosmadopoulos Bank	1923	1924	1.01	1.92	10,000	10,107
Tekton Construction Co.	1923	1924	0.61	1.06	50,000	30,321
Avezap Sugar Prod. Co.	1923	1925	0.44	0.99	30,000	13,274
Agricultural Industry Co.	1924	1925	0.32	0.93	30,000	9,596
Bank of Thessaly	1924	1925	0.64	0.88	150,000	95,963
Bank of Hellenic Securities	1924	1925	0.66	0.90	105,000	69,573
Maritime Bank	1924	1924	0.65	0.69	19,000	12,290
Vermion Manuf. Co.	1924	1925	0.78	1.37	35,000	27,189
Hellenic Silk Co.	1924	1925	0.71	1.66	70,000	49,500
Naoussa Wool Ind.	1924	1925	0.32	1.30	50,000	15,993
Atlas Cements Co.	1925	1925	0.91	2.41	85,000	77,570
Helios Sugar Company	1925	1926	0.28	0.28	14,032	3,993
Ergon Technical Construction	1925	1925	0.64	1.41	50,000	31,987
Pharmaceutical Union Co.	1925	1925	0.46	0.80	20,000	9,276
Cold Storage Piraeus	1925	1925	0.48	0.51	14,000	6,717
Anatoli Ind. Co.	1926	1927	0.27	0.53	2,000	542
Olympos Cement Co.	1927	1929	1.00	0.58	50,000	50,000
Akte Technical Company	1927	1928	0.54	0.62	30,215	16,228
Ertha Maritime and Hydr. Works	1928	1929	1.00	1.20	15,500	15,500
Bank of Laconia	1929	1929	0.29	0.34	50,000	14,666
Trikala Weaving Co.	1935	1936	0.16	0.17	20,000	3,158
FIX Breweries	1935	1936	0.28	0.63	58,185	16,410
ETHEL Rubber Co.	1937	1938	0.54	0.98	27,000	14,667
Iris Chocolate Manuf.	1938	1939	0.10	0.12	10,000	998
Evangelistria Flour Mills	1938	1939	0.25	0.32	14,000	3,493

Appendix E: List of IPOs

This table presents statistics for 21 Initial Public Offerings listed in Athens Stock Exchange between 1884 and 1940. It includes statistics on offer price, trading price, mean rate of initial returns (%), adjusted initial returns, raising funds (in gold sovereign) and money left on the table

IPO	Year	Offer Price	Trading Price	Mean Rate of Initial Returns (%)	Adjusted Initial Returns	Raising Funds (in Gold Sov.)	Money left on the Table (in Gold Sov.)
Powder Co.	**1884**	3.78	3.02	-20	-8.22	21,255	0
Hpiro-Thessaly Bank	**1887**	10.37	9.00	-13.33	-43.61	72,955	0
Thessaly Railways	**1887**	9.00	5.01	-44.23	-32.01	920,000	0
S. P.A.P. Railways	**1887**	8.64	5.46	-36.8	-41.87	1,390,986	0
Régie des Revenus Affectés	**1898**	3.48	2.28	-34.4	-39.16	40,000	0
Bank of Crete	**1900**	4.88	4.21	-13.79	-17.88	89,600	0
Bank of Orient	**1906**	5.58	5.66	1.30	-0.07	223,357	0
Commercial Bank	**1909**	3.82	3.82	0	2.89	29,795	0
Ermis Industrial Co.	**1917**	4.07	5.29	30	25.64	8,943	2,682
Isaias - Megaris Wines and Spirits	**1918**	5.24	5.64	7.69	-0.10	50,363	3,872
Enosis Wine and Spirits Co.	**1925**	0.33	1.31	300	299.03	6,398	19,192
Kekrops Construction	**1925**	0.33	2.01	510	499.92	12,235	62,400
Athena Car Company	**1925**	0.32	1.75	450	435.34	6,398	28,788
Sanitas Pharmaceutical Products Ind.	**1925**	0.30	0.91	200	185.68	3,359	6,717
Georgiadis-Sekeris Wood Ind.	**1925**	0.28	0.95	240	236.74	5,758	13,818
Commercial Credit Bank	**1925**	0.28	1.25	350	280.63	42,450	148,575
Kyklops Pottery	**1925**	0.28	1.03	270	175.93	1,040	2,806
Hellenic Carpet Factory	**1926**	0.78	0.94	20.91	16.62	2,426	507.2
Chemical Industries	**1926**	0.24	0.41	70	67.82	3,105	2,173
Diamantopoulos Construction	**1927**	0.27	0.69	160	156.29	7,997	12,795
Bank of Greece	**1930**	13.33	20.27	52	75.57	537,115	279,300

Appendix F: Previous Literature on Historical IPOs

The table provides a summary of the Historic IPO literature concentrating mainly in U.S., Germany and the UK. It indicates the Journal where the articles were published, the period that every study explores, the number of IPOs involved, the level of underpricing and a summary of the main findings

Author(s) –Year	Journal	Market	Period of Study	No of IPOs	Underpricing	Main Findings
Fohlin (2000)	Working Paper	Germany - U.S.	1882-1892, 1998-2000	335	Germany : 10%-22% U.S.: 11%-17%	German results show that significant information asymmetries exist despite universality and formal relationships. The price of shares contains important positive information about the quality or expected returns of new issues.
Jovanovic and Rousseau (2001)	American Economic Review	U.S.	1890-2000 1890-1899 1900-1909 1910-1919 1920-1929	21,516 112 112 214 545		Companies that first listed at the close of the 19th century were as young as the companies today. The electricity-era and the information technology-era firms came in younger.
Wright (2002)	Accounting, Business and Financial History	U.S.	-	-	-	The early history of the market (1781–1861) shows that unregulated IPO markets can function efficiently. Early US corporations successfully sold equities directly to investors without the aid of intermediaries because they could overcome information asymmetry cheaply. Today, the Information Revolution is again decreasing the cost of reducing information asymmetry between investors and issuers.
Schlag and Wodrich (2005)	Working Paper	Germany	1882-1914	297	4.81%	Underpricing of IPOs has existed but it is considerably lower than that observed on today's markets. Employing a mixture of distributions approach we also find evidence of price stabilization of IPOs.
Burhop (2008)	Working Paper	Germany	1870-1896	180 Pre 1884: 87 Post 1884: 93	1.92% 0.63% 3.25%	In contrast to modern data, first day returns were extraordinary low and averaged less than five percent, even during the speculative period of the early 1870s. The past market return had a negative influence on initial returns.
Chambers and Dimson (2009)	Journal of Finance	UK	1917-1986 1917-1945 1946-1986	2553 610 1943	7.26% 3.80% 9.15%	During the period from 1917 to 1945, public offers were underpriced by an average of only 3.80%, as compared to 9.15% in the period from 1946 to 1986, and even more after the U.K. stock market was deregulated in 1986. The post-WWII rise in underpricing cannot be attributed to changes in firm composition, and occurred in spite of improvements in regulation, disclosure, and the prestige of IPO underwriters.
Chambers (2009)	Economic History Review	U.K.	1946-1986 1960-1969 1970-1979 1980-1986	Tender - Fixed Offer 118 - 714 68 - 336 1 - 219 49 - 159	Tender-Fixed Offer 6.39% - 9.76% 5.62% - 6.49% 2.14% - 7.72% 7.55% - 8.95%	By the 1960s, underpricing of IPOs in the UK was regarded as excessive. The tender method (i.e. adopted only by ten firms) delivered substantially lower underpricing than the fixed-price offer public. This missed opportunity cost issuing firms between £1.7 billion and £3.5 billion in real proceeds between 1960-1986.
Lehman (2010)	Working Paper	Germany	1897-1914	370	2.18%	IPOs of banks with a higher reputation did not perform better than those issued by smaller banks. Universal banks,

						who were so important for the industrialisation were not as important on the German stock market before WW I.
Chambers (2010)	Financial History Review	U.K.	1919-1938	1406	-	Consistent with the pecking order theory, Interwar IPO proceeds contributed only modestly to domestic industry's capital expenditure needs. In terms of the quality of firms allowed onto the market, IPO survival rates of the early and late 1920s were low. IPOs of capital-hungry new manufacturing industries raised no more finance than did the rest of manufacturing.
Fohlin (2010)	Journal of Economic History	Germany	1882-1892	250	7.23%	Investors in new stock issues in Germany in the 1880s experienced low spreads between the price they paid for stock and the price at which they could sell the stock in the market.
Fohlin and Reinold (2010)	Journal of Historical Economics and Econometric History	Germany	1904-1910			The results indicate that the Berlin market did not suffer from unusually large pricing anomalies; thus, its performance was not substantially different from modern markets. Also supporting the conclusion of market efficiency, a momentum portfolio earns returns not different from zero, on average.
Chambers (2010)	Working Paper	UK	1900-2009 1900-1909 1910-1919 1920-1929 1930-1939	6621 496 451 704 446	Junior - StartUps 63% - 29% 80% - 38% 100% -12% 100%-5%	Although, the LSE had probably become the first choice for many firms seeking a listing in the UK by the interwar period, there were 21 other stock exchanges throughout Britain, all established before WWI.
Burhop (2011)	German Economic Review	Germany	1882-1992	180 87 (pre 1884) 94 (post 1994)	2.49% 0.49 4.37%	The first-day returns were extraordinary low and averaged less than 5%, even during the speculative period of the early 1870s. In contrast to modern markets, underpricing was higher during hot issue markets. The study indicates that cash-flow relevant information contained in the corporate charter was readily factored in the first market price. Thus, the historical capital market differed from today's market, but seems to have been efficient.
Burhop, Chambers, Cheffins (2014)	Explorations in Economic History	UK	1900-1913	825		Report that the failure rate of IPOs by way of Special Settlement SS was considerably higher even after controlling for firms characteristics and for the presence of underwriters and elite directors. Overall market-adjusted returns for SS IPOs, including the relatively few IPO "winners", were extremely poor.
Lehmann (2014)	Economic History Review	Germany	1896-1913	705	3%	Although the German IPO business was in the hands of a small oligopoly, investors did not benefit from the lack of competition. One explanation is that the quality of IPOs on the German stock market of the time was very good in general as a result of the competition between underwriters.

Appendix G: Parity of gold sovereign-drachma in 1880-1940 period

This table presents the exchange rate between British Gold Sovereign and Greek Drachmas over the period of the study (1880-1940)

Year	Gold Sovereign	Year	Gold Sovereign	Year	Gold Sovereign
1880	28,60	1903	39,49	1926	386,51
1881	29,46	1904	34,43	1927	368,55
1882	29,64	1905	30,80	1928	372,36
1883	28,29	1906	27,61	1929	375,00
1884	26,02	1907	27,13	1930	375,00
1885	25,96	1908	26,85	1931	375,00
1886	30,34	1909	25,84	1932	753,00
1887	31,63	1910	25,94	1933	865,40
1888	32,11	1911	25,16	1934	867,90
1889	30,51	1912	25,13	1935	873,50
1890	30,95	1913	25,27	1936	886,40
1891	32,42	1914	25,16	1937	909,70
1892	36,60	1915	25,03	1938	920,40
1893	39,77	1916	24,63	1939	1.002,00
1894	43,14	1917	24,60	1940	1.076,20
1895	44,20	1918	24,82		
1896	43,39	1919	24,32		
1897	41,08	1920	34,07		
1898	36,92	1921	70,38		
1899	39,02	1922	166,54		
1900	40,89	1923	296,44		
1901	41,36	1924	247,35		
1902	40,68	1925	312,62		

Sources: - Riginos, M., The movement of exchange rates and money in the Greek market (1856-1912), Athens, 1997
- Athens Stock Exchange Yearbook, 1974, p.286